ADDENDUM NUMBER: 4
UNC CHARLOTTE
ELM, MAPLE AND PINE RESIDENCE HALLS RENOVATIONS
SCO#120994003 - Code: 41226 - Item 307
PROJECT NUMBER 3523-00
February 4, 2016

NOTICE TO CONTRACTORS

This Addendum issued prior to receipt of Bid shall and does hereby become a part of the Construction Documents for the above project.

All principal Contractors shall be responsible for seeing that their Subcontractors are properly apprised of the contents of this Addendum.

All information contained in this Addendum shall supersede and shall take precedence over any conflicting information in the original Bidding Documents dated 12/18/15 and all previous Addendum.

All Contractors shall acknowledge receipt of this Addendum in the space provided in the Proposal Form. Failure to do so may subject Bidder to disqualification.

A. CHANGES TO PRIOR ADDENDA
No changes.

B. CHANGES TO BIDDING REQUIREMENTS
No changes.

C. CHANGES TO CONDITIONS OF THE CONTRACT
No changes.

D. CHANGES TO SPECIFICATIONS

SECTION - 00 05 00 FORM OF PROPOSAL
a. Spec Section reissued in its entirety.

SECTION - 00 73 00 SUPPLEMENTARY GENERAL CONDITIONS
a. Section reissued in its entirety.

SECTION - 01 21 00 ALLOWANCES
a. Spec Section reissued in its entirety.

SECTION - 01 22 00 UNIT PRICES
a. Spec Section reissued in its entirety.

SECTION - 08 71 00 DOOR HARDWARE
a. Section reissued in its entirety.

SECTION - 26 36 00 TRANSFER SWITCHES

a. 1.05 D.

Replace the last sentence in this paragraph with “Switch shall be U.L labeled in accordance with standards 1 ½ and 3 cycle, long time rating”.

SECTION - 27 15 00 APPENDIX D

a. Delete "Appendix D" and replace with "UNC ITS Specifications."

E. CHANGES TO DRAWINGS

SHEET - A084 ROOF DEMOLITION PLANS

a. Sheet reissued dated 2/4/16. Clarification of demolition requirements of existing roof assemblies.

SHEET - A101 1ST FLOOR PLANS

a. Sheet reissued dated 2/4/16 - for the door “H” tags at all 1st floor utility closets with a keynote referencing Sheet A141.

SHEET - A141 ENLARGED FLOOR PLANS

a. Sheet reissued dated 2/4/16. Revision to Unit entry door tags from A2 to A1.

SHEET - A200 DOOR SCHEDULES, DOOR TYPES, & DETAILS

a. Sheet reissued dated 2/4/16 - door schedule revised.

SHEET - A402 ENLARGED STAIR/ELEVATOR PLANS - ELM HALL EAST

a. Sheet reissued dated 2/4/16 - revised to include a plan, section, and elevation for the new access panel alcove for control panels.

SHEET - A408B MAPLE PORCH PLAN & SECTIONS - ALT #7

a. Sheet reissued dated 2/4/16 revised for setting bed clarification.

SHEET - C200 DEMOLITION PLANS

a. Sheet reissued dated 2/4/16. Add removal of 5 Hollies.
Delete tree protection fence for 5 Hollies.

SHEET - C300 OVERALL SITE PLANS

a. Sheet reissued dated 2/4/16. Revision to ramps and stair between Maple and Pine.

SHEET - C301 ENLARGED SITE PLAN - NORTH

a. Sheet reissued dated 2/4/16. Revision to ramps and stair between Maple and Pine.

SHEET - C310 SITE LOGISTICS PLANS

a. Sheet reissued dated 2/4/16. Clarification of completion date for phased site work.

SHEET - C400 EROSION CONTROL PLAN PHASE 1

a. Sheet reissued dated 2/4/16. Delete tree protection fence for 5 Hollies.

SHEET - C401 EROSION CONTROL PLAN PHASE 2

a. Sheet reissued dated 2/4/16. Delete tree protection fence for 5 hollies.

SHEET - C500 OVERALL GRADING AND DRAINAGE PLAN

a. Sheet reissued dated 2/4/16. Revision to ramps and stair between Maple and Pine.

SHEET - C501 ENLARGED GRADING PLAN NORTH

a. Sheet reissued dated 2/4/16. Revision to ramps and stair between Maple and Pine.

SHEET - C600 OVERALL UTILITY PLAN

a. Sheet reissued dated 2/4/16. Delete tree protection fence for 5 Hollies.

SHEET - C601 ENLARGED UTILITY PLAN NORTH

a. Sheet reissued dated 2/4/16. Delete tree protection fence for 5 Hollies.

SHEET - C602 ENLARGED UTILITY PLAN SOUTH

a. Sheet reissued dated 2/4/16. Delete tree protection fence for 5 Hollies.

SHEET - C603 UTILITY CROSSING NORTH

a. Sheet reissued dated 2/4/16. Delete tree protection fence for 5 Hollies.

SHEET - C604 UTILITY CROSSING SOUTH

a. Sheet reissued dated 2/4/16. Delete tree protection fence for 5 Hollies.

SHEET - C903 SITE DETAILS

a. Sheet reissued dated 2/4/16. Labeled landing locations. Revised handrails.

SHEET - C904 SITE DETAILS

a. Sheet reissued dated 2/4/16. Labeled landing locations. Revised handrails.

SHEET - E001 SYMBOLS, GENERAL NOTES, LIGHTING FIXTURE SCHEDULE

a. Sheet reissued dated 2/4/16. Revised light fixture schedule.

SHEET - E060 DEMOLITION ELECT. STIE PLAN

a. Sheet reissued dated 2/4/16. Revised note 11 regarding existing hand hole.

SHEET - E070 NEW WORK ELECT. SITE PLAN

a. Sheet reissued dated 2/4/16. Revised site lighting. Added electrical circuits for mechanical heat trace. Revised and added blue light phone/pole installations.

SHEET - E101CF ELM NEW WORK FIRST FLOOR - COMMUNICATION 7 FIRE ALARM

a. Sheet reissued dated 2/4/16. Removed hearing impaired devices in suite E104. Modified notes 2, 3, and 6 regarding

SHEET - E101LP ELM NEW WORK FIRST FLOOR - LIGHTING & POWER

a. Sheet reissued dated 2/4/16. Revised exterior building lighting and door alarms.

SHEET - E201CF MAPLE NEW WORK FIRST FLOOR - COMMUNICATION & FIRE ALARM

a. Sheet reissued dated 2/4/16. Revised card reader and door alarms.

SHEET - E201LP MAPLE NEW WORK FIRST FLOOR - LIGHTING & POWER

. Sheet reissued dated 2/4/16. Revised exterior and interior lighting, door alarms and added ADA door operator.

SHEET - E202LP MAPLE NEW WORK SECOND FLOOR - LIGHTING & POWER

A. Sheet reissued dated 2/4/16. Revised lighting in lounge M200-D.

SHEET - E203LP MAPLE NEW WORK THIRD FLOOR - LIGHTING & POWER

a. Sheet reissued dated 2/4/16. Revised lighting in lounge M200-D.

SHEET - E405 ELM LARGE SCALE - POWER

a. Sheet reissued dated 2/4/16. Delete ADA power to doors in suite E104.

SHEET - E504 ELM HALL COMMUNICATION ROUGH-IN RISER

a. Sheet reissued dated 2/4/16. Added 1 ½" conduit sleeve.

SHEET - E601 ELM HALL PANEL BOARD SCHEDULES

a. Sheet reissued dated 2/4/16. Revised panel "OL1".

SHEET - E604 MAPLE HALL PANEL BOARD SCHEDULES

a. Sheet reissued dated 2/4/16. Revised panel "OL1B."

SHEET - I100 IRRIGATION PLAN

a. Sheet reissued dated 2/4/16. Added irrigation pump in an insulated, heated enclosure. The Contractor shall provide the pump design in the irrigation submittals. Provide pump, enclosure, and power for the pump and heater.

SHEET - L100 LANDSCAPE PLAN BASE BID

a. Sheet reissued dated 2/4/16. Revised landscape design. Added planter bed preparation notes.

SHEET - L110 LANDSCAPE PLAN ALTERNATE 9

a. Sheet reissued dated 2/4/16. Revised landscape design. Added planter bed preparation notes.

SHEET - L111 ENGLARGED LANDSCAPE PLAN - NORTH ALTERNATE 9

a. Sheet reissued dated 2/4/16. Revised landscape design. Added planter bed preparation notes.

SHEET - L112 ENLARGED LANDSCAPE PLAN - SOUTH ALTERNATE 9

a. Sheet reissued dated 2/4/16. Revised landscape design. Added planter bed preparation notes.

SHEET - M100 SITE PLAN MECHANICAL NEW WORK

A. Sheet reissued dated 2/4/16. Addition of central energy plant

SHEET - M101 1ST FLOOR MECHANICAL PLANS NEW WORK

a. Sheet reissued dated 2/4/16. Clarification of exhaust fan control panel locations.

SHEET - M501 MECHANICAL SCHEDULES

a. Sheet reissued dated 2/4/16. Mechanical schedule and detail additions for energy plant heating.

SHEET – S303 – FOUNDATION SECTIONS

a. Sheet reissued dated 2/4/16. Revised Details 4 & 5.

SHEET – S400 – FRAMING DETAILS

a. Sheet reissued dated 2/4/16. Revised Detail 11.

SHEET - T202 BACKBONE SYSTEMS AND MEDIA MANAGER DETAILS

a. Sheet reissued dated 2/3/16. Revised controls

SHEET - T203 ACCESS CONTROL DETAILS

a. New sheet issued dated 2/3/16 - door access details.

F. CLARIFICATIONS

1. Alternate #7 & drawing A408B: please define the intended setting bed & joint material for paver alternate. **Response: The setting bed for the brick pavers shall be a minimum of 1" in depth. The material shall be concrete sand per ASTM C 33. Details 1, 4, 11, 13, & 23 have been revised to include this dimension and material designation.**

2. Please see the attached substitution request from Peachtree Covers. We respectfully request approval to bid the metal wall panels on this project. Peachtree Protective Covers' systems meet or exceed the performance requirements listed in the specification. **Response: Peachtree Protective Covers, Inc. is approved as an acceptable bidder. Section 07 42 64, Article**

2.01A shall be revised to include them at 2.01.2.d. "Peachtree Protective Covers, Inc.: www.peachtreecovers.com."

3. Item 1: MM Media Manager T202 Detail C
   Is the media manager to be provided and installed by the Division 26 or Division 27 contractor?
   Response: **Yes.**

   Do you have a manufacturer and model number for the Media Manager? **Response: SIEMON HC-ENCL-20-80**

4. Item 2: POE Switch T202 Detail C
   This detail states the 8 port switch is to be provided and installed by the contractor.

   Please can you confirm the manufacturer and model number of the switch? **Response: See Sheet T202 – Addendum 4.**

5. Item 3: Wireless Access Point Locations
   Are these to be cabled from the MM Media Manager or the TR? **Response: MM Media Manager.**

6. Item 4: RG6/U Coaxial Cable
   Do you have a preferred manufacturer and part number for the RG6/U Coaxial Cable?
   Response: See UNC-Charlotte IT Design Standards.

7. Item 5: RG11/U Direct Burial Coaxial Cable T202 Detail D
   Do you have a preferred manufacturer and part number for the RG11/U Direct Burial Coaxial Cable? **Response: SEE UNC-CHARLOTTE IT DESIGN STANDARDS**

   Also can you confirm this is a part of the Division 27 scope of work? **Response: YES**

8. Item 6: Pine Hall and Elm 1st floor TR Backbone Connectivity T202
   The riser diagrams on prints T202 do not show any backbone connectivity to the 1st floor
   Response: Tr's all backbone start from I.T. M107A.

   Please can you confirm the backbone connectivity requirements (if any) and origination point for? **Refer to Sheet T202 for all connectivity requirements.**

   Fiber

   Copper

   Coax

9. Item 5: Outside plant innerduct. Please can you confirm this will be the responsibility of the Division 27 contractor? **Response: It shall be the responsibility of Division 26.**

10. From Helical pier sub: Do you have the load capacities (KIPS) for the Helical piers? Also for bidding purposes we'll need a "bid depth." I can submit a price per linear foot for drilling beyond the bid depth.
    I see the eleven locations where we are underpinning, (4) helical piers, at each location 5/S303.
    Response: 5/S303 indicates the load capacity for each helical pier to be 3,000 lbs. Specification Sections 01 21 00 Allowances and 01 22 00 Unit Prices as well as 00 05 00

Form of Proposal have been revised in Addendum 4 to address bidding requirements specific to the underpinning system.

11. Also on Page 88, in the "Bid Packet," (4.1.2 Elevator Shaft), Underpinning is required, and HELICAL PIERS, are mentioned as an option. Please let me know if a decision is made on this. **Response: The underpinning is indicated on the structural drawings to be by the underpinning contractor. Helical Piers is an available option though other methods are allowable if the contractor wishes to address underpinning differently.**

12. Enlarged Plans, 1/S110-1/S111-1/S112-Note: "Underpin Existing Foundation by contractor." Please let me know if there are helical piers needed for this underpinning. Please contact me for any questions. **Response: The underpinning is indicated on the structural drawings to be by the underpinning contractor. Helical Piers is an available option though other methods are allowable if the contractor wishes to address underpinning differently. Detail 5/S303 indicates the load capacity for each helical pier to be 3,000 lbs. Specification Sections 01 21 00 Allowances and 01 22 00 Unit Prices as well as 00 05 00 Form of Proposal have been revised in Addendum 4 to address bidding requirements specific to the underpinning system. The design load for the underpinning is 6 kips per foot of excavation along the strip footings.**

13. Please clarify what scope of work the Owner will be suppling in regards to Divisions 27 and 28. **Response: Owner requirements w/ respect to Divisions 27 and 28 are addressed on New Sheet T203 and previously issued Sheet T202.**

14. This request comes from roofing contractors. Please provide a description of the existing roofing assembly giving type, thickness and existing deck type. Core testing of the existing roof system is not allowed. **Response: See reissued Sheet A084.**

15. On Drawing A140, Key Notes 8, 9 & 10 tell us that the Owner will provide & install these items. However, Section 11 31 00 tells us to provide these same items. Please clarify. **Response: General Note 11 on Sheet A140, Detail 10, indicates that the GC shall provide these items as part of Alternate Bid No. 11.**

20. Note 54 on Drawing C301 stated to see Detail 4/S303. There is not a Detail 4 on S303. Please direct me to the correct detail. **Response: See reissued Sheet S303.**

ADDENDUM NUMBER: 4
UNC CHARLOTTE
ELM, MAPLE AND PINE RESIDENCE HALLS RENOVATIONS

ENCLOSURES:

SPECIFICATION SECTIONS

00 05 00	FORM OF PROPOSAL
00 73 00	SUPPLEMENTARY CONDITIONS
01 21 00	ALLOWANCES
01 22 00	UNIT PRICES
08 71 00	DOOR HARDWARE
27 15 00	ITS TELECOMMUNICATIONS STANDARDS

SHEETS

CIVIL	ARCH	MECH	ELEC
C200	A084	M100	E001
C300	A101	M101	E070
C301	A141	M501	E101CF
C400	A200	E101LP	
C401	A402	E201CF	
C500	A408B	E201LP	
C501		E202LP	
C600		E203LP	
C601		E405	
C602		E504	
C603		E601	
C604			
C903			
C904			

INTERIOR	LANDSC	TELECOM
I100	L110	T202
L111		T203
L112		

End of Addendum

F O R M O F P R O P O S A L

Elm Maple Pine Res. Hall Renovations Contract:_____

University of North Carolina at Charlotte Bidder: _____

SCO ID# 12-09940-03A Date:_____

The undersigned, as bidder, hereby declares that the only person or persons interested in this proposal as principal or principals is or are named herein and that no other person than herein mentioned has any interest in this proposal or in the contract to be entered into; that this proposal is made without connection with any other person, company or parties making a bid or proposal; and that it is in all respects fair and in good faith without collusion or fraud. The bidder further declares that he has examined the site of the work and the contract documents relative thereto, and has read all special provisions furnished prior to the opening of bids; that he has satisfied himself relative to the work to be performed. The bidder further declares that he and his subcontractors have fully complied with NCGS 64, Article 2 in regards to E-Verification as required by Section 2.(c) of Session Law 2013-418, codified as N.C. Gen. Stat. § 143-129(j).

The Bidder proposes and agrees if this proposal is accepted to contract with the

State of North Carolina through the University of North Carolina at Charlotte

in the form of contract specified below, to furnish all necessary materials, equipment, machinery, tools, apparatus, means of transportation and labor necessary to complete the construction of

This project involves the interior renovations and addition to the Elm, Maple and Pine Residence Halls

in full in complete accordance with the plans, specifications and contract documents, to the full and entire satisfaction of the **State of North Carolina**, and the

University of North Carolina at Charlotte and KSQ/Peterson

with a definite understanding that no money will be allowed for extra work except as set forth in the General Conditions and the contract documents, for the sum of:

SINGLE PRIME CONTRACT:

Base Bid:

_____ Dollars($)_____

General Subcontractor:
_____ Lic_____

Plumbing Subcontractor:
_____ Lic_____

Mechanical Subcontractor:
_____ Lic_____

Electrical Subcontractor:
_____ Lic_____

GS143-128(d) requires all single prime bidders to identify their subcontractors for the above subdivisions of work. A contractor whose bid is accepted shall not substitute any person as subcontractor in the place of the subcontractor listed in the original bid, except (i) if the listed subcontractor's bid is later determined by the contractor to be non-responsible or non-responsive or the listed subcontractor refuses to enter into a contract for the complete performance of the bid work, or (ii) with the approval of the awarding authority for good cause shown by the contractor.

ALTERNATES:

Should any of the alternates as described in the contract documents be accepted, the amount written below shall be the amount to be "added to" or "deducted from" the base bid. (Strike out "Add" or "Deduct" as appropriate.)

GENERAL CONTRACT:

Alternate No. 1. Provide and install porcelain tile in lieu of sheet vinyl at all Apartment Bathrooms as indicated on the Drawings and as specified in Sectio 09 30 00 of the Project Manual.

(Add/Deduct) _____

_____ Dollars ($) _____

Alternate No. 2. Provide and install vinyl plank flooring in lieu of carpet at all Apartment Living Rooms as indicated on the drawings and as specified in Section 09 65 19 of the Project Manual.

(Add/Deduct) _____

_____ Dollars ($) _____

Alternate No. 3. Provide and install vinyl plank flooring in lieu of sheet vinyl at all Apartment Kitchens as indicated on the drawings and as specified in Section 09 65 19 of the Project Manual.

(Add/Deduct) _____

_____ Dollars ($) _____

Alternate No. 4. Provide and install solid surface countertops in lieu of plastic laminate countertops in all Apartment Kitchens as indicated on the drawings and as specified in Section 12 36 61 of the Project Manual.

(Add/Deduct) _____

_____ Dollars ($) _____

Alternate No. 5. Provide and install solid surface countertops with integral sinks as specified in Section 12 36 61 in all Apartment Bathrooms in lieu of plastic laminate countertops with vitreous sinks as indicated on the drawings and as specified in the Project Manual.

(Add/Deduct) _____

_____ Dollars ($) _____

Alternate No. 6. Provide and install solid surface window sills in lieu of plastic laminate window sills at all aluminum windows as indicated on the drawings and as specified in Section 06 83 00 of the Project Manual.

(Add/Deduct)_____

_____Dollars ($)_____

Alternate No. 7. Provide and install brick pavers in lieu of concrete at the Porch at the Maple Hall Addition as indicated on the drawings and as specified in the Project Manual.

(Add/Deduct)_____

_____Dollars ($)_____

Alternate No. 8. Provide and install new roof hatches, ships ladders, and associated steel framing and rooftop guardrails as indicated on the drawings and as specified in Sections 05 50 00 and 07 72 00 of the Project Manual.

(Add/Deduct)_____

_____Dollars ($)_____

Alternate No. 9. Provide and install landscaping as indicated on the drawings and as specified in the Project Manual.

(Add/Deduct)_____

_____Dollars ($)_____

Alternate No. 10. All plant bed and mulch areas are to be prepared according to the soil preparation instructions in the University of North Carolina at Charlotte Design and Construction Manual, Division 02-32 - Exterior Improvements, Section 32 84 20 - Landscape Grading and Drainage, Part 3 - Execution, Paragraph C - Soil Preparation.

(Add/Deduct)_____

_____Dollars ($)_____

Alternate No. 11. Provide and install all washers, dryers and refrigerators as indicated on the drawings and as specified in the Project Manual.

(Add/Deduct)_____

_____Dollars ($)_____

Alternate No. 12. Provide and install rubber flooring and rubber stair treads/risers as indicated on the drawings and as specified in the Project Manual.

(Add/Deduct)_____

_____Dollars ($)_____

Alternate No. 13. Provide and install carpet flooring and rubber base as indicated on the drawings and as specified in the Project Manual.

(Add/Deduct)_____

_____Dollars ($)_____

Alternate No. 14. Provide and install all interior telecommunications cabling and devices as indicated on the telecommunications drawings and as specified in Division 27 of the Project Manual.

(Add/Deduct)_____

_____Dollars ($)_____

Alternate No. 15. Provide and install all telecommunications equipment utilizing the materials, specifications and certifications as specified in the UNC-Charlotte Preferred Vendor Equipment Materials List - Appendix D.

(Add/Deduct)_____

_____Dollars ($)_____

UNIT PRICES

Unit prices quoted and accepted shall apply throughout the life of the contract, except as otherwise specifically noted. Unit prices shall be applied, as appropriate, to compute the total value of changes in the scope of the work all in accordance with the contract documents.

GENERAL CONTRACT:

UP-1 – Placement of Cast Underlayment according to Division 03 Section "Cast Underlayment." per square foot. Unit Price ($)_____

UP-2 – Undercut and removal of unsuitable soil as directed by Geotechnical Engineer, removal off-site, and replacement with suitable material compacted to proper density per cubic yard. Unit Price ($)_____

UP-3 – Removal of pit/footing rock and replacement with a controlled backfill material from an on-site source per cubic yard. Unit Price ($)_____

UP-4 – Addition or deletion of helical piers or other underpinning system per lineal foot. Unit Price ($)_____

The bidder further proposes and agrees hereby to commence work under this contract on a date to be specified in a written order of the designer and shall fully complete all work thereunder within the time specified in the Supplementary General Conditions Article 23. Applicable liquidated damages amount is also stated in the Supplementary General Conditions Article 23.

MINORITY BUSINESS PARTICIPATION REQUIREMENTS

Provide with the bid - Under GS 143-128.2(c) the undersigned bidder shall identify **on its bid** (Identification of Minority Business Participation Form) the minority businesses that it will use on the project with the total dollar value of the bids that will be performed by the minority businesses. **Also** list the good faith efforts (Affidavit **A**) made to solicit minority participation in the bid effort.

NOTE: A contractor that performs all of the work with its own workforce may submit an Affidavit (**B)** to that effect in lieu of Affidavit (**A)** required above. The MB Participation Form must still be submitted even if there is zero participation.

After the bid opening - The Owner will consider all bids and alternates and determine the lowest responsible, responsive bidder. Upon notification of being the apparent low bidder, the bidder shall then file within 72 hours of the notification of being the apparent lowest bidder, the following:

An Affidavit (**C**) that includes a description of the portion of work to be executed by minority businesses, expressed as a percentage of the total contract price, which is equal to or more than the 10% goal established. This affidavit shall give rise to the presumption that the bidder has made the required good faith effort and Affidavit **D** is not necessary;

*** OR ***

If less than the 10% goal, Affidavit (**D**) of its good faith effort to meet the goal shall be provided. The document must include evidence of all good faith efforts that were implemented, including any advertisements, solicitations and other specific actions demonstrating recruitment and selection of minority businesses for participation in the contract.

Note: Bidders must always submit **with their bid** the Identification of Minority Business Participation Form listing all MB contractors, vendors and suppliers that will be used. If there is no MB participation, then enter none or zero on the form. Affidavit A **or** Affidavit B, as applicable, also must be submitted with the bid. Failure to file a required affidavit or documentation with the bid or after being notified apparent low bidder is grounds for rejection of the bid.

Proposal Signature Page

The undersigned further agrees that in the case of failure on his part to execute the said contract and the bonds within ten (10) consecutive calendar days after being given written notice of the award of contract, the certified check, cash or bid bond accompanying this bid shall be paid into the funds of the owner's account set aside for the project, as liquidated damages for such failure; otherwise the certified check, cash or bid bond accompanying this proposal shall be returned to the undersigned.

Respectfully submitted this day of _____

_____
(Name of firm or corporation making bid)

WITNESS:

_____
(Proprietorship or Partnership)

By: _____
Signature

Name: _____
Print or type

Title _____
(Owner/Partner/Pres./V.Pres)

Address _____

_____

ATTEST:

By: _____

Title: _____
(Corp. Sec. or Asst. Sec. only)

License No. _____

Federal I.D. No. _____

Email Address: _____

(CORPORATE SEAL)

Addendum received and used in computing bid:

Addendum No. 1 _____ Addendum No. 3 _____ Addendum No. 5 _____ Addendum No. 6 _____

Addendum No. 2 _____ Addendum No. 4 _____ Addendum No. 6 _____ Addendum No. 7 _____

SUPPLEMENTARY GENERAL CONDITIONS

The following modify the January 2013, 24rd Edition of the GENERAL CONDITIONS OF THE CONTRACT, STATE OF NORTH CAROLINA FORM OC-15. Unaltered provisions of the General Conditions shall remain in effect. These modifications shall be incorporated into all Contract Forms.

1.1 ARTICLE 1 - DEFINITIONS

A. Add the following definitions:

B. Add to the end of the paragraph "The Geotechnical Technical Report does not constitute a part of the Contract Documents, but is included for reference."

C. The “Owner” is the State of North Carolina through the University of North Carolina at Charlotte.

D. The “Designer” referred to herein, shall mean (designer to insert design firm name and address).

E. "Equal To" or "Approved Equal" Add: “substitute products by manufacturers other than those specified in the Project Manual, Addenda, and on the drawings and which may be incorporated in the Work after review and concurrence by the Architect and acceptance by the Owner. This review shall be in accordance with the General Requirements”.

F. "Provide." Shall mean furnish and install complete in place, and ready for use.

G. "Indicated" and "Shown." Shall mean as detailed, scheduled, or called for in the Contract Documents.

H. "Latest Edition." Shall mean the current printed document issued up to 30 calendar days prior to date of receipt of bids, unless specified otherwise.

I. "Quality." Shall mean the meticulous attention to the detail of installation and workmanship necessary to the assemblage of products in the highest grade of excellence by skilled craftsmen of the trade.

J. "Drawings" or "Plans" mean the drawings enumerated in the Contract (including all information in the Detail Manual).

K. "Specifications" mean this Project Manual and Addenda thereto, and this term shall include such pages as are enumerated in the Contract as applicable to the work involved.

L. "Supplementary Conditions", as referred to in other parts of the Project Manual, shall be the same as "Supplementary General Conditions."

M. Project Identification: All correspondence, reports, schedules, applications for payment, fax items, etc., shall contain formal title of project, code and item numbers, and SCO ID numbers.

1.2 ARTICLE 6 - WORKING DRAWINGS AND SPECIFICATIONS AT THE JOB SITE

A. Change “Designer” to “Designer, State, and Owner”

1.3 ARTICLE 10 - PERMITS, INSPECTIONS, FEES, REGULATIONS

A. ADD to paragraph e:

The Contractor shall perform the Work in accordance with University North Carolina, Charlotte regulations and the Preconstruction Conference Checklist (if such checklist is furnished).

1.4 ARTICLE 13 - INSPECTION OF THE WORK

A. ADD to paragraph a:

The Contractor shall also serve the same notice to the Owner for all such inspections or testing.

B. ADD paragraph n:

The Contractor shall post a sign indicating firearms are prohibited on the job site.

1.5 ARTICLE 21 - MINOR CHANGES IN THE WORK.

A. Revise the first sentence by adding after “The Designer…”

“with consultation with the Owner.”

1.6 ARTICLE 23 - TIME OF COMPLETION, DELAYS, EXTENSIONS OF TIME

A. SUBSTITUTE as paragraph b:

The Contractor shall commence work to be performed under this Agreement on the issued Notice to Proceed, and shall fully complete all work hereunder by June 23, 2017. The Contractor shall have full access to the Project Site on May 16, 2016. The Contractor is responsible for “on-time” performance and shall be responsible for identifying and appropriately coordinating long lead materials and equipment to maintain the project schedule. For each day in excess of the contract duration, the Contractor shall pay to the Owner, the sum of Two Thousand Five Hundred Dollars ($2,500.00) per calendar day until August 1, 2017 and the sum of One Hundred Dollars ($100.00) per calendar day per bed after August 1, 2017 the work is delayed beyond the completion date or authorized extension thereof, as liquidated damages reasonably estimated in advance to cover the losses to be incurred by the Owner by reason of failure of said contractor to complete the work within the time specified, such time being of the essence of this contract and a material consideration thereof. For site work identified in the Phasing Note on Sheet C310, the Contractor shall pay to the Owner Twenty Four Thousand Eight Hundred Dollars ($24,800.00) per each calendar day the Work is delayed beyond July 29, 2016 or authorized extension thereof, as liquidated damages reasonably estimated in advance to cover the losses to be incurred by the Owner by reason of failure of said Contractor to complete the Work within the time specified, such time being of the essence of this contract and a material consideration thereof.

B. ADD to subparagraph c:

After the contract completion date, the Designer shall deduct from all contractor pay applications, the liquidated damages in the amount of the daily liquidated damage rate times the number of calendar days after the contract completion date minus any previously assessed liquidated damages.

1.7 ARTICLE 24 - PARTIAL UTILIZATION: BENEFICIAL OCCUPANCY.

A. ADD to paragraph e:

Unless training requirements are included in the specifications, prior to issuance of Date of Acceptance, the Contractor shall have his/her authorized representatives visit the Project and give full instructions to the Owner's designated operating and maintenance, care, and adjustment of all equipment and special construction elements."

1.8 ARTICLE 34 - MINIMUM INSURANCE REQUIREMENTS

A. Modify the second sentence in Subparagraph c to read as follows:

"This insurance shall include the interests of the Owner, the General Contractor, the Subcontractors, and the Sub-subcontractors in the work and shall insure **against risks of direct physical loss – (all perils).**"

B. ADD paragraph f:

The Designer shall be named as additional insured party on all insurance policies supplied by the Contractor. Final payment will not be made until these "As-Built Drawings" are turned over to the Designer of record and reviewed and deemed complete in writing by the Designer.

1.9 ARTICLE 40 - UTILITIES, STRUCTURES, SIGNS

A. ADD to paragraph j:

The University will provide the Contractor with access to electrical power for operating small tools, for construction lighting, for elevator testing, and for field office operations. The University will not charge the Contractor for power so consumed. The Contractor will bear all costs related to connecting to, transforming, and distributing power from the connection point. The Contractor will bear all costs related to connecting to, transforming, distributing and maintaining temporary power from the connection point.

The Contractor shall allocate power equitably. Welding equipment and other high power users must have self-contained power sources. Power outages shall be coordinated by the Contractor with the University 30 days in advance.

1.10 ARTICLE 45 - TAXES.

A. ADD to paragraph e:

Contractors shall submit monthly with their request for payment, a signed statement containing the amount of sales and use tax paid by the Contractor for that particular billing period."

1.11 ARTICLE 48 – ASBESTOS CONTAINING MATERIALS (ACM).

A. ADD the following:

No asbestos containing material may be installed in this facility, including but not limited to, sprayed-on insulation, pipe insulation, floor tile, mastic adhesive, patch materials, wiring insulation, or acoustical treatment.

END OF SUPPLAMENTARY GENERAL CONDITIONS

SECTION 01 21 00

ALLOWANCES

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Cash allowances.

1.02 RELATED REQUIREMENTS

A. Section 01 26 00 - Contract Modification Procedures: Additional payment and modification procedures.

1.03 SUBMITTALS

A. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.

B. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.04 ALLOWANCES SCHEDULE

A. **Allowance No. 1:** Cast underlayment for existing concrete slabs requiring leveling of existing surface. Include the quantity of 500 square feet with an average thickness of 1 inch. Provide cementitious cast underlayment in accordance with Section 03 54 00.

Allowance No. 2: Undercut and removal of unsuitable soil as directed by Geotechnical Engineer, removal on-site, and replacement with suitable material compacted to proper density. Include the quantity of 62 cubic yards. Provide removal of unsuitable soils and replacement in accordance with Section 31 20 00.

Allowance No. 3: Trench Rock Excavation and Removal (On-Site Fill): Include the removal of 96 cubic yards of trench rock including all necessary equipment, material and labor for trench rock excavation and removal in accordance with Section 31 20 00. Provide the replacement of trench rock with compacted fill from on-site in accordance with Section 31 20 00.

Allowance No. 4: Include the stipulated sum/price of $25,000.00 for use upon Owner's instructions for the labor and material required for new and existing firestoping conditions required to meet code compliance.

Allowance No. 5: Include an allowance of 20 lineal feet for each helical pier or other underpinnning system. Allowance shall include the underpinning design by the underpinning contractor at the elevator pits utilizing a load of 6 kips per foot.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION

SECTION 01 22 00

UNIT PRICES

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. List of unit prices.

B. Measurement and payment criteria applicable to Work performed under a unit price payment method.

1.02 COSTS INCLUDED

A. Unit Prices shall include full compensation for all required labor, products, tools, equipment, plant, transportation, services and incidentals; erection, application or installation of an item of the Work; overhead and profit.

1. Overhead shall include all Conditions of the Contract and all general requirements such as Project management, scheduling, home office expense, layout, reproduction of Drawings and Specifications, testing and inspection, shop drawings and sample coordination, shop drawing preparation, proposal request estimating, supervision (including general and nonworking foremen) small tools and expendable items, taxes, temporary facilities and services, including access and safety provisions, "as-built" drawings, estimating general and administrative overhead, and profit. Pricing of proposal requests need to be accomplished within 20 calendar days minimum following receipt by the contractor. Upon request, the contractor shall provide the designer with documentation to substantiate labor rates.
2. In the event of additions and deletions of items of direct labor and/or material, the item quantities shall be algebraically summed prior to the incorporation of applicable prices, Unit Prices, and/or the overhead and profit percentage applicable.

1.03 MEASUREMENT OF QUANTITIES

A. Measurement methods delineated in the individual specification sections complement the criteria of this section. In the event of conflict, the requirements of the individual specification section govern.

B. Take all measurements and compute quantities. Measurements and quantities will be verified by Architect.

C. Assist by providing necessary equipment, workers, and survey personnel as required.

1.04 PAYMENT

A. Payment for Work governed by unit prices will be made on the basis of the actual measurements and quantities of Work that is incorporated in or made necessary by the Work and accepted by the Architect, multiplied by the unit price.

B. Payment will not be made for any of the following:

1. Products wasted or disposed of in a manner that is not acceptable.
2. Products determined as unacceptable before or after placement.
3. Products remaining on hand after completion of the Work.
4. Loading, hauling, and disposing of rejected Products.

1.05 UNIT PRICES

A. Schedule of Unit Prices:

1. **UP-1** - Cast Underlayment
   a. Description: Placement of Cast Underlayment according to Division 03 section “Cast Underlayment.”
      1) Unit of measurement: Per square foot, in place, average thickness 1 inch.

2. **UP-2** - Undercut and removal of unsuitable soil as directed By Geotechnical Engineer, removal off-site, and replacement with suitable material compacted to proper density.
    a. Description: Removal, disposal off-site, and replacement of unsuitable soil with a controlled backfill material from an off-site source.
        1) Unit of Measurement: Cubic yard of unsuitable soil measured and removed in original position and not exceeding requirements of specification section 31 20 00.
3. **UP-3** - Pit/Footing Rock removal and suitable soil replacement from on-site source per cubic yard.
    a. Description: Removal of pit/footing rock and replacement with a controlled backfill material from an off-site source.
        1) Unit of Measurement: Cubic yard of rock measured and removed in original position and not exceeding requirements of specification Section 31 20 00.
4. **UP-4** - Helical piers or other underpinning systems.
    a. Description: Addition or deletion of helical piers or other underpinning system required and as stated in Allowance No. 5 in Section 01 21 00 - Allowances.
        1) Unit of Measurement: Per lineal foot in accordance with the Structural Drawings.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION

SECTION 08 71 00

DOOR HARDWARE

PART 1 - GENERAL

1.01 SUMMARY

A. This Section includes commercial door hardware for the following:
   1. Swinging doors.
   2. Mechanical door hardware.
   3. Electromechanical door hardware, power supplies, back-ups and surge protection.
   4. Automatic operators.
   5. Cylinders specified for doors in other sections.
   6. Related Sections:
      a. Section 06 10 00 - Rough Carpentry.
      b. Section 06 20 00 - Finish Carpentry.
      c. Section 08 11 13 - Hollow Metal Doors and Frames.
      d. Section 08 41 13 - Aluminum-Framed Entrances and Storefronts.
      e. Section 28 13 00 - Access Control.
   7. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.
      a. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
      b. ICC/IBC - International Building Code.
      c. NFPA 80 - Fire Doors and Windows.
      d. NFPA 101 - Life Safety Code.
      e. NFPA 105 - Installation of Smoke Door Assemblies.
      f. State Building Codes, Local Amendments.
   8. Standards: All hardware specified herein shall comply with the following industry standards:
      a. ANSI/BHMA Certified Product Standards - A156 Series
      b. UL10C - Positive Pressure Fire Tests of Door Assemblies

1.02 SUBMITTALS

A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.

B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware. Organized into door hardware sets indicating type, style, function, size, label, hand, manufacturer, fasteners, location, degree of opening, and finish of each door hardware item. Include description of each electrified door hardware function, wiring diagrams and sequence of operation.
   1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
   2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.
   3. Content: Include the following information:
      a. Type, style, function, size, label, hand, and finish of each door hardware item.
      b. Manufacturer of each item.

c. Fastenings and other pertinent information.
d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
e. Explanation of abbreviations, symbols, and codes contained in schedule.
f. Mounting locations for door hardware.
g. Door and frame sizes and materials.
h. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.

4. Shop Drawings: Details of electrified access control hardware indicating the following:
   a. Wiring Diagrams: Upon receipt of approved schedules, submit detailed system wiring diagrams for power, signaling, monitoring, communication, and control of the access control system electrified hardware. Differentiate between manufacturer-installed and field-installed wiring. Include the following:
      1) Elevation diagram of each unique access controlled opening showing location and interconnection of major system components with respect to their placement in the respective door openings.
      2) Wiring instructions for each electronic hardware component scheduled herein.
   b. Electrical Coordination: Coordinate with related Division 26 Electrical Sections the voltages and wiring details required at electrically controlled and operated hardware openings.
5. Keying Schedule: Contact UNC Charlotte’s housing lock shop to obtain bittings.
6. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Submittals. The manual to include the name, address, and contact information of the manufacturers providing the hardware and their nearest service representatives. The final copies delivered after completion of the installation test to include "as built" modifications made during installation, checkout, and acceptance.
7. Warranties and Maintenance: Special warranties and maintenance agreements specified in this Section.

1.03 QUALITY ASSURANCE

A. Supplier Qualifications:
   1. Person who is or employs a qualified DHI Architectural Hardware Consultant.
   2. Shall have supplied jobs of similar size and value.
   3. Shall have been in the business of supplying finish hardware for a minimum of five years.
   4. Installer Qualifications: Installers, trained by the primary product manufacturers, with a minimum 3 years documented experience installing both standard and electrified builders hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
   5. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor in good standing by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.
      a. Scheduling Responsibility: Preparation of door hardware and keying schedules.

6. Automatic Operator Supplier Qualifications: Power operator products and accessories are required to be supplied and installed through current members of the manufacturer's "Power Operator Preferred Installer" program. Suppliers are to be factory trained, certified, and a direct purchaser of the specified power operators and be responsible for the installation and maintenance of the units and accessories indicated for the Project.
7. Source Limitations: Obtain electrified door hardware from same manufacturer as mechanical door hardware, unless otherwise indicated. Manufacturers that are listed to perform electrical modifications, by a testing and inspecting agency acceptable to authorities having jurisdiction, are acceptable.
    a. Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third party source will not be accepted.
    b. Provide electromechanical door hardware from the same manufacturer as mechanical door hardware, unless otherwise indicated.
8. Regulatory Requirements: Comply with NFPA 70, NFPA 80, NFPA 101 and ANSI A117.1 requirements and guidelines as directed in the model building code including, but not limited to, the following:
    a. NFPA 70 "National Electrical Code", including electrical components, devices, and accessories listed and labeled as defined in Article 100 by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
    b. Where indicated to comply with accessibility requirements, comply with Americans with Disabilities Act (ADA), "Accessibility Guidelines for Buildings and Facilities (ADAAG)," ANSI A117.1 as follows:
        1) Handles, Pulls, Latches, Locks, and other Operating Devices: Shape that is easy to grasp with one hand and does not require tight grasping, tight pinching, or twisting of the wrist. Handles wrap to door completely.
        2) Door Closers: Comply with the following maximum opening-force requirements indicated:
            (a) Interior Hinged Doors: 5 lbf applied perpendicular to door.
            (b) Fire Doors: Minimum opening force allowable by authorities having jurisdiction.
            (c) Thresholds: Not more than 1/2 inch high. Bevel raised thresholds with a slope of not more than 1:2.
    c. NFPA 101: Comply with the following for means of egress doors:
        1) Latches, Locks, and Exit Devices: Not more than 15 lbf to release the latch. Locks shall not require the use of a key, tool, or special knowledge for operation.
        2) Thresholds: Not more than 1/2 inch high.
    d. Fire-Rated Door Assemblies: Provide door hardware for assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to NFPA 252 (neutral pressure at 40" above sill) or UL-10C.
        1) Test Pressure: Positive pressure labeling.
9. Each unit to bear third party permanent label demonstrating compliance with the referenced standards.
10. Keying Conference: Conduct conference at Project site. Incorporate keying conference decisions into final keying schedule. Submit schematic to manufacturer at time of order. The keying meeting will establish everything pertaining to the owners keying requirements for the pertaining project. If a keying meeting is not conducted, then the key/cylinder order is null and void.
    a. Function of building, purpose of each area and degree of security required.
    b. Plans for existing and future key system expansion.
    c. Requirements for key control storage and software.
    d. Installation of permanent keys, cylinder cores and software.
    e. Address and requirements for delivery of keys.

11. Keys: All keys shall be labeled and copy of finalized schematic drop shipped to owner by registered mail.
12. Pre-Submittal Conference: Conduct coordination conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier(s), Installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.
    a. Prior to installation of door hardware, arrange for manufacturers' representatives to hold a project specific training meeting to instruct the installing contractors' personnel on the proper installation and adjustment of their respective products. Product training to be attended by installers of door hardware (including electromechanical hardware) for aluminum, hollow metal and wood doors. Training will include the use of installation manuals, hardware schedules, templates and physical product samples as required.
    b. Inspect and discuss electrical roughing-in, power supply connections, and other preparatory work performed by other trades.
    c. Review sequence of operation narratives for each unique access controlled opening.
    d. Review and finalize construction schedule and verify availability of materials.
    e. Review the required inspecting, testing, commissioning, and demonstration procedures
13. At completion of installation, provide written documentation that components were applied to manufacturer's instructions and recommendations and according to approved schedule.
14. Templates: Obtain and distribute templates for doors, frames, finish hardware and other work specified to be factory prepared for installing door hardware.
15. Standards: Comply with BHMA A156 series standards, Grade 1.
16. Certified Products: Provide door hardware that is listed in BHMA directory of certified products.

1.04 WARRANTY

A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

B. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:
    1. Structural failures including excessive deflection, cracking, or breakage.
    2. Faulty operation of the hardware.
    3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
    4. Electrical component defects and failures within the systems operation.
    5. Special Warranty Periods:
        a. Minimum of seven years for bored locks and latches.
        b. Minimum of five years for exit hardware.
        c. Minimum of twenty five years for manual door closer bodies.
        d. Minimum of two years for electromechanical door hardware

1.05 EXTRA MATERIALS/ATTIC STOCK

A. Furnish full-size units described below that match products installed and that are packaged with protective covering and identified with labels describing contents.
    1. Doors/Door Hardware: Furnish locks and panic hardware less cylinders and keys.
        a. Exit Devices - Non-Electrified Rim/Vertical Rod - 2 each
        b. Cylindrical Non-Electrified Locks: 4 of each function scheduled.
        c. Continuous Hinges: 4 of each function.
        d. Butt Hinges: 12

e. Electrical Parts:
   1) Electric strikes: 2 of each function.
   2) Power supplies: 2 of each manufacturer.
   3) Prop Alarms: 2
   4) Magnetic hold opens: 4 complete (magnet and arm)

1.06 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.

B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.

C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

1.07 COORDINATION

A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.

B. Door Hardware and Electrical Connections: Coordinate the layout and installation of scheduled electrified door hardware and related access control equipment with required connections to source power junction boxes, low voltage power supplies, detection and monitoring hardware, and fire and detection alarm systems.

C. Door and Frame Preparation: Related Division 08 Sections (Steel, Aluminum and Wood) doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications..

PART 2 - PRODUCTS

2.01 SCHEDULED DOOR HARDWARE

A. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.
   1. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets at the end of Part 3. Products are identified by using door hardware designations, as follows:
      a. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.
   2. Substitutions: Requests for substitution and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01, Substitution Procedures. Approval of requests is at the discretion of the owner.

2.02 HANGING DEVICES

A. Hinges: ANSI/BHMA A156.1 certified butt hinges with number of hinge knuckles as specified in the Door Hardware Sets.
   1. Quantity: Provide the following hinge quantity, unless otherwise indicated:
      a. Two Hinges: For doors with heights up to 60 inches.
      b. Three Hinges: For doors with heights 61 to 90 inches.
      c. Four Hinges: For doors with heights 91 to 120 inches.

d. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.
e. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:
   1) Widths up to 3'0": 4-1/2" standard or heavy weight as specified.
   2) Sizes from 3'1" to 4'0": 5" standard or heavy weight as specified.
f. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:
   1) Interior Doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.
   2) Exterior Doors and stairwell doors: Geared continuous hinges only.
g. Hinge Options: Comply with the following where indicated in the Hardware Sets or on Drawings:
   1) Non-removable Pins: Provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the following applications:
      (a) Out-swinging exterior doors.
      (b) Out-swinging access controlled doors.
      (c) Out-swinging lockable doors.
h. Acceptable Manufacturers:
   1) Hager Companies (HAG).
   2) McKinney Products Company (MCK).
   3) Stanley Commercial Hardware; Div. of The Stanley Works (STH).

2. Continuous Geared Hinges: ANSI/BHMA A156.26 certified continuous geared hinge with minimum 0.120-inch thick extruded 6060 T6 aluminum alloy hinge leaves and a minimum overall width of 4 inches. Hinges are non-handed, reversible and fabricated to template screw locations. Provide concealed flush mount (with or without inset), full surface, or half surface, in standard and heavy duty models, as specified in the Hardware Sets. Concealed continuous hinges to be U.L. listed for use on up to and including 90 minute rated door installations and U.L. listed for windstorm components where applicable. Factory cut hinges for door size and provide with removable service power transfer panel where indicated at electrified openings.
   a. Acceptable Manufacturers:
      1) Select Products Limited (SPL).
      2) McKinney Products Company. (MCK).
      3) Pemko Manufacturing Co., Inc. (PEM).

2.03 ELECTRIFIED DOOR HARDWARE

A. ELECTRIC STRIKES:
   1. Standard Electric Strikes: Heavy duty, cylindrical and mortise lock electric strikes conforming to ANSI/BHMA A156.31, Grade 1, UL listed for both Burglary Resistance and for use on fire rated door assemblies. Stainless steel construction with dual interlocking plunger design tested to exceed 3000 lbs. of static strength and 350 ft-lbs. of dynamic strength. Strikes tested for a minimum 1 million operating cycles. Provide strikes with 12 or 24 VDC capability and supplied standard as fail-secure unless otherwise specified. Option available for latchbolt and latchbolt strike monitoring indicating both the position of the latchbolt and locked condition of the strike.
   2. Acceptable Manufacturers:
      a. TRINE (TN) - 4100 Series
      b. HES (HS) -1006 Series.
      c. Surface Mounted Rim Electric Strikes: Surface mounted rim exit device electric strikes conforming to ANSI/BHMA A156.31, Grade 1, and UL Listed for both Burglary Resistance and for use on fire rated door assemblies. Construction includes internally mounted solenoid with two heavy-duty, stainless steel locking mechanisms operating independently to provide tamper resistance. Strikes tested for a minimum of 1,500,000 operating cycles. Provide strikes with 12 or 24 VDC capability supplied

standard as fail-secure unless otherwise specified. Option available for latchbolt and latchbolt strike monitoring indicating both the position of the latchbolt and locked condition of the strike. Strike requires no cutting to the jamb prior to installation. Surface mounted Rim Electric strikes are to work with conjunction with ANSI A156.3, Type 28 Grade 1, square bolt type exit devices only.

d. Acceptable Manufacturers:
   1) TRINE (TN) - 4800 SERIES
   2) HES (HS) - 9500 Series.

e. Provide electric strikes with in-line power controller and surge suppressor by the same manufacturer as the strike with combined products having unlimited lifetime warranty.

f. Acceptable Manufacturers:
   1) McKinney Products (MK) - QC-C Series.

2.04 DOOR OPERATING TRIM

A. Flush Bolts and Surface Bolts: ANSI/BHMA A156.3 and A156.16, Grade 1, certified automatic, self-latching, and manual flush bolts and surface bolts. Manual flush bolts to be furnished with top rod of sufficient length to allow bolt location approximately six feet from the floor. Furnish dust proof strikes for bottom bolts. Surface bolts to be minimum 8” in length and U.L. listed for labeled fire doors and U.L. listed for windstorm components where applicable. Provide related accessories (mounting brackets, strikes, coordinators, etc.) as required for appropriate installation and operation.

1. Acceptable Manufacturers:
   a. Door Controls International (DC).
   b. Rockwood Manufacturing (RO).
   c. Trimco (TC).
2. Coordinators: ANSI/BHMA A156.3 certified door coordinators consisting of active-leaf, hold-open lever and inactive-leaf release trigger. Coordinators fabricated from steel with nylon-coated strike plates and built-in adjustable safety release.
   a. Acceptable Manufacturers:
      1) Door Controls International (DC).
      2) Rockwood Manufacturing (RO).
      3) Trimco (TC).
3. Door Push Plates and Pulls: ANS/BHMA A156.6 certified door pushes and pulls of type and design specified below or in the Hardware Sets. Coordinate and provide proper width and height as required where conflicting hardware dictates.
   a. Push/Pull Plates: Minimum.050 inch thick, 4-inches wide by 16-inches high, with square corners and beveled edges, secured with exposed screws unless otherwise indicated.
   b. Straight Pull Design: Minimum 1-inch round diameter stainless steel bar or tube stock pulls with 2 1/2-inch projection from face of door unless otherwise indicated.
   c. Offset Pull Design: Minimum 1-inch round diameter stainless steel bar or tube stock pulls with 2 1/2-inch projection and offset of 90 degrees unless otherwise indicated.
   d. Push Bars: Minimum 1-inch round diameter horizontal push bars with minimum clearance of 2 1/2-inch projection from face of door unless otherwise indicated.
   e. Fasteners: Provide manufacturer's designated fastener type as indicated in Hardware Sets.
      1) Acceptable Manufacturers:
         (a) Hiawatha, Inc. (HI).
         (b) Rockwood Manufacturing (RO).
         (c) Trimco (TC).

2.05 CYLINDERS, KEYING, AND STRIKES

A. Mechanical Room (HVAC, Telecom/Data & Electrical) Cylinders: Tumbler type, constructed from brass or bronze, stainless steel, or nickel silver.
   1. Number of Pins: Six.
   2. All mechanical cylinders and keys shall be furnished and installed by the Owner.
   3. Refer to hardware sets for cylinder types and locations required.
   4. Electro/Mechanical Cylinders: Provide electronic cylinders by Medeco to match and extend the owners existing key system.
      a. Cylinders to be Logic Classic type.
      b. All electro-mechanical cylinders and keys shall be furnished and installed by the owner.
      c. Cylinders and keys shall be programmed, installed and maintained by the University HRL Lockshop, with coordination of the contractor.
      d. Locations:
         1) As indicated in sets.
   5. Cylinder guard rings are to be used on each Mortise and Rim Cylinder where applicable.
   6. Cylinder Guards: Manufacturer:
      a. KEEDEX - K-24L-26D
      b. Others upon approval.

2.06 MECHANICAL LOCKS AND LATCHES

A. Cylindrical Locksets, Grade 1 (Commercial Duty): ANSI/BHMA A156.2, Series 4000, Grade 1 certified.
   1. Locks are to be non-handed and fully field reversible.
   2. Acceptable Manufacturers:
      a. Arrow Locks (AW) - QL Series.
      b. Corbin Russwin Hardware (RU) - CL3500 Series.
      c. Dorma Products (DO) - CL800 Series.
   3. Backset: 2-3/4 inches, unless otherwise indicated.

2.07 AUXILIARY LOCKS

A. Narrow Body Mortise Latches: ANSI/BHMA A156.5, Grade 1, certified mortise type deadlocks constructed of heavy gauge wrought corrosion resistant steel. Steel or stainless steel latch bolts with a 3/4" throw and hardened steel roller pins.
   1. Acceptable Manufacturers:
      a. Adams Rite (AD) - 4900 Series.

2.08 LOCK AND LATCH STRIKES

A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:
   1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
   2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
   3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.
   4. Standards: Comply with the following: Field verify and furnish matching strike type at existing frames where applicable.
      a. Strikes for Mortise Locks and Latches: BHMA A156.13.
      b. Strikes for Auxiliary Deadlocks: BHMA A156.5.
      c. Dustproof Strikes: BHMA A156.16.

2.09 EXIT DEVICES

A. Manufacturers:
1. Yale Security Inc. (YAL). 7150
2. Corbin Russwin Architectural Hardware Inc. (CR). ED-5200S
3. Securitech Group (SH) 936 Series
4. Panic Exit Devices: Shall be listed and labeled for panic protection, based on testing according to UL 305.
5. Fire Exit Devices: Shall complying with NFPA 80, listed and labeled for fire and panic protection, based on testing according to UL 305 and NFPA 252.
6. Only rim type exit devices are to be used. Where pairs of doors are required provide a keyed removable mullion.
7. All latch bolts shall be deadlocking.
8. Rim exit devices shall have slide action deadbolt with positive deadlocking in lieu of pullman type latchbolt.
   a. Shall comply with ANSI A156.3, Type 28 Grade 1.
9. Exit devices to be provided with impact resistant end cap bracket and end cap (see Yale ECK3 for reference only).
10. All exposed metal shall be in BHMA 630. Aluminum anodized finish will not be accepted.
11. Outside operating trim shall be through-bolted with concealed fasteners.
12. Operating trim shall be freewheeling with clutch mechanism allowing lever to rotate 60 degrees when locked to prevent vandalism.
13. Dummy Push Bar: Nonfunctioning push bar matching functional push bar.
14. End cap bracket shall be drilled and tapped into metal doors and through bolted into wood doors.
15. Tube Steel Removable Mullions: ANSI/BHMA A156.3 removable steel mullions with malleable-iron top and bottom retainers and a primed paint finish. Provide keyed removable feature, stabilizers, and mounting brackets as specified in the Hardware Sets. At openings designed for severe wind load conditions due to hurricanes or tornadoes, provide manufacturers approved mullion and accessories to meet applicable state and local windstorm codes.
   a. Acceptable Manufacturers:
      1) Corbin Russwin 907KBM
      2) Yale Locks and Hardware (YA) - M200 Series.

2.10 DOOR CLOSERS

A. Shall be certified ANSI A156.4 Grade 1.

B. Surface-Mounted Closers:
1. Shall have multi sized spring power adjustment for sizes 2 thru 6 or 1thru 4 for barrier free applications.
2. Shall have full covers.
3. Provide soffit plate for parallel arm applications using aluminum frames with blade stops or snap on stops.
4. Manufacturers:
   a. Yale (YA) 5800 Series.
   b. Dorma (DMA) 8900 Series.
   c. Stanley D4550 Series. Stanley Commercial Hardware; Div. of The Stanley Works (STH).
5. Size of Units: Multi-sized, adjustable to meet field conditions and requirements for opening force.
6. Installation of door closers should be non-viewable throughout the corridors. Parallel, Heavy Duty arms are preferred (Push Side). If a Parallel arm closer will be viewed throughout a corridor, then a non parallel door closer arm is acceptable to remove the door closer body and arm from a viewable corridor side (Pull Side).
7. All door closers are to be through bolted on all wood doors.

8. All door closers are to be installed with provided self tapping/self drilling screws on all hollow metal and aluminum doors.
9. Drop plates are to be applied as needed.
10. Support block with 5th screw to be installed as applicable.

2.11 POWER ASSIST CLOSERS/ADA DOOR OPENERS:

A. Provide surface operator that complies with ANSI A156.19

B. Manufacturers:
1. Norton (NOR) 5700 Series
2. Dorma (DMA) ED800 Series
3. Stanley (STN) D-4990 Series

C. Units to be provided with Enforcer radio frequency receiver and 2 fobs per operator location as indicated in sets.

D. Closer bodies can be installed with self tapping/drilling screws into metal doors. Closer bodies are to be through bolted into wood doors.

2.12 STOPS AND HOLDERS

A. Stops and Holders:
1. All doors shall have a doorstop that effectively protects any and all doors, walls and finish hardware that comes into contact with the operation of the function of the door. Wall stops are the preferred method.
2. Provide sufficient blocking and reinforcement for secure installation and operation of all stops and holders.
3. Pre-hung door units to receive hinge pin stops where wall stops are not able to effectively stop and protect the door.
4. Overhead stops shall be provided where required if wall stop can not stop and protect the doors, walls or finish hardware from damage.
5. Oversized floor stops are only permitted for exterior doors.
6. Closer stop arms are only permitted if specified in hardware set.
7. Manufacturers:
a. McKinney (MK)
b. Rockwood Manufacturing (RM)
c. Pemko Manufacturing Co., Inc. (PEM)

B. Silencers for Door Frames: Neoprene or rubber; fabricated for drilled-in application to frame.

2.13 ARCHITECTURAL TRIM

A. Door Protective Trim
1. General: Door protective trim units to be of type and design as specified below or in the Hardware Sets.
2. Size: Fabricate protection plates (kick, armor, or mop) not more than 2" less than door width (LDW) on stop side of single doors and 1” LDW on stop side of pairs of doors, and not more than 1" less than door width on pull side. Coordinate and provide proper width and height as required where conflicting hardware dictates. Height to be as specified in the Hardware Sets.
3. Metal Protection Plates: ANSI/BHMA A156.6 certified metal protection plates (kick, armor, or mop), eased on four edges, fabricated from the following.
a. Stainless Steel: 050-inch thick, with countersunk screw holes (CSK).
b. Fasteners: Provide manufacturer's designated fastener type as specified in the Hardware Sets.
c. Acceptable Manufacturers:
1) Hiawatha, Inc. (HI).
2) Rockwood Manufacturing (RO).
3) Trimco (TC).

2.14 ARCHITECTURAL SEALS

A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.

B. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.
   1. Provide smoke labeled perimeter gasketing at all smoke labeled openings.
   2. Fire Labeled Gasketing::Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.
      a. Provide intumescent seals as indicated to meet UL10C Standard for Positive Pressure Fire Tests of Door Assemblies, and UBC 7-2, Fire Tests of Door Assemblies.
   3. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated, based on testing according to ASTM E 1408.
   4. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.
   5. Hurricane Resistance Compliance: Architectural seals to be U.L. listed for windstorm components where applicable. Provide the appropriate hurricane or tornado resistant products that have been independent third party tested, certified, and labeled to meet state and local windstorm building codes applicable to project.
   6. Acceptable Manufacturers:
      a. Pemko Manufacturing (PE).
      b. Reese Enterprises, Inc. (RS).
      c. Zero International (ZE).

2.15 FABRICATION

A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.16 FINISHES

A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.

B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware.

C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.

B. It is imperative that the supplier field verify all conditions where existing material is being used with new products. Field check existing strike and hinge preparations in existing frames and furnish type and sizes to match.

C. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Where scheduled hardware is not compatible with existing frame or door preparations, notify architect immediately. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.02 PREPARATION

A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.

B. Wood Doors: Comply with ANSI/DHI A115-W series

3.03 INSTALLATION

A. Examine doors and frames for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.

B. Electronic Hardware: Installer of electric hardware to be tested prior to interface with the access control system. Make field modifications in existing frames for electric strikes, power transfer accommodations and electronic controls.

C. Steel Door and Frame Preparation: Comply with DHI A115 series. Drill and tap doors and frames for surface-applied hardware according to SDI 107.

D. Wood Door Preparation: Comply with DHI A115-W series.

E. Hardware Installation: Shall be in accordance to manufactures instructions.

F. Mounting Heights: Comply with the following requirements, unless otherwise indicated:
   1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
   2. Custom Steel Doors and Frames: DHI's "Recommended Locations for Builders' Hardware for Custom Steel Doors and Frames."
   3. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
   4. Miscellaneous Accessories: Shall be provided as necessary for the proper and secure attachment of all hardware to doors and frames.
   5. Adjust and reinforce attachment substrates as necessary for proper installation and operation. Drill and tap units that are not factory prepared for fasteners. Space fasteners and anchors according to industry standards.
      a. Boxed Power Supplies: Locate power supplies as indicated or, if not indicated, above accessible ceilings. Verify location with Architect.
         1) Configuration: Provide one power supply for each door. It is acceptable to provide the number of power supplies required to adequately supply doors with electrified door hardware.
      b. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."
   6. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with accessibility requirements.
      a. Door Closers Adjustments:
         1) Adjust sweep period so that from an open position of 70 degrees, the door will take at least three seconds to move to a point 3 inches from the latch, measured to the leading edge of the door.
         2) Adjust back-check to slow the door opening at about 75 degrees, when door is forcibly opened beyond its pre-adjusted

3.04 FIELD QUALITY CONTROL

A. Field Inspection: Supplier will perform a final inspection of installed door hardware and state in report whether work complies with or deviates from requirements, including whether door hardware is properly installed, operating and adjusted.

B. Door supplier shall be responsible, based on field audit of existing work to remain in place, to match new hardware to existing door and frame preparations.

3.05 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.06 CLEANING AND PROTECTION

A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.

B. Clean adjacent surfaces soiled by door hardware installation.

C. Clean operating items as necessary to restore proper finish. and provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

3.07 DEMONSTRATION

A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

3.08 DOOR HARDWARE SCHEDULE

A. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.

MK - McKinney
PE - Pemko
RO - Rockwood
YA - Yale
AD - Adams Rite
AW - Arrow Lock
MC - Medeco
SC - Schlage
TR - Trine Access Technology
RF - Rixson
NO - Norton
SA - Sargent
SU - Securitron

Hardware Schedule

Set: 1.0

Doors: S-E1-1C, S-E2-1C, S-P1-1C, S-P2-1C
Description: Existing Exterior Card Access/Exit

1	Logic Cylinder	By Owner	26	MC
1	Cylinder Guard Ring	By Owner	26D	KD
1	Rim Electric Strike	4801	US32D	TR
1	Card Reader	By Owner		SA
1	Power Supply	By Owner		SU

Notes: Access control panel and security management software by others.
OPERATION: Outside reader temporarily unlocks electric strike: automatic relock. Electric strike is fail-secure.
Balance of existing hardware to remain.

Set: 2.0

Doors: E100C, M100A, M106-1, P100C, S-M2-1C
Description: Exterior Aluminum Card Access/Exit

1	Continuous Hinge	CFM83HD1		PE
1	Exit Device (rim, nightlatch)	7150 632F ECK1	630	YA
1	Logic Cylinder	By Owner	26	MC
1	Cylinder Guard Ring	By Owner	26D	KD
1	Rim Electric Strike	4801	US32D	TR
1	Door Closer	5821	689	YA
1	Threshold	1715AK WS10SS		PE
1	Sweep	315CN TKSP8		PE
1	Card Reader	By Owner		SA
1	Power Supply	By Owner		SU

Notes: Perimeter gasket by frame manufacturer.
Access control panel and security management software by others.
OPERATION: Outside card reader temporarily unlocks electric strike: automatic relock. Electric strike is fail-secure.

Set: 2.1

Doors: S-M1-1C
Description: Existing Aluminum Entry/Exit with Added Card Access & ADA Operator

1	Rim Electric Strike	4801	US32D	TR
1	Automatic Operator	5730 SN-134	689	NO

1 RF Kit (Enforcer)	SK-910RBQ x (2) SK-919TP4J-NUQ		EN
1 Card Reader	By Owner		SA
1 Power Supply	By Owner		SU

Notes: Balance of existimh hardware to remain.
Access control panel and security management software by others.
OPERATION: Outside card reader temporarily unlocks electric strike: automatic relock. Electric strike is fail-secure.
Prepare frame header for future Norton 5730 handicap operator.

Set: 2.2

Doors: M106A

Description: Existing Exterior Card Access/Exit with ADA Operator

1 Exit Device (rim, nightlatch)	7150 632F ECK1	630	YA
1 Logic Cylinder	By Owner	26	MC
1 Cylinder Guard Ring	By Owner	26D	KD
1 Rim Electric Strike	4801	US32D	TR
1 Automatic Operator	5730 SN-134	689	NO
1 RF Kit (Enforcer)	SK-910RBQ x (2) SK-919TP4J-NUQ		EN
1 Card Reader	By Owner		SA
1 Power Supply	By Owner		SU

Notes: Balance of existimh hardware to remain.
Access control panel and security management software by others.
OPERATION: Outside card reader temporarily unlocks electric strike: automatic relock. Electric strike is fail-secure.
Prepare frame header for future Norton 5730 handicap operator.

Set: 3.0

Doors: E100A, P100A

Description: Exterior Aluminum Card Access/Exit + ADA Operator

1 Continuous Hinge	CFM83HD1		PE
1 Exit Device (rim, nightlatch)	7150 632F ECK1	630	YA
1 Logic Cylinder	By Owner	26	MC
1 Cylinder Guard Ring	By Owner	26D	KD
1 Rim Electric Strike	4801	US32D	TR
1 Automatic Operator	5730 SN-134	689	NO
1 RF Kit (Enforcer)	SK-910RBQ x (2) SK-919TP4J-NUQ		EN
1 Threshold	1715AK WS10SS		PE
1 Sweep	315CN TKSP8		PE
1 Card Reader	By Owner		SA
1 Power Supply	By Owner		SU

Notes: Perimeter gasket by frame manufacturer.
Access control panel and security management software by others.
OPERATION: Outside card reader temporarily unlocks electric strike: automatic relock. Electric strike is fail-secure.
Prepare frame header for future Norton 5730 handicap operator.

Set: 4.0

Doors: M105B

Description: Exterior Aluminum Storefront with Card Access & ADA Operator

1	Continuous Hinge	CFM83HD1		PE
1	Deadlatch	4900	628	AD
1	Paddle Operator	4591- Pull	628	AD
1	Logic Cylinder	By Owner	26	MC
1	Cylinder Guard Ring	By Owner	26D	KD
1	Electric Strike	EN 400	US32D	TR
1	Push Bar & Pull	BF15747	US32D	RO
1	Automatic Operator	5730 SN-134	689	NO
1	RF Kit (Enforcer)	SK-910RBQ x (2) SK-919TP4J-NUQ		EN
1	Threshold	1715AK WS10SS		PE
1	Sweep	345AV TKSP8		PE
1	Card Reader	By Owner		SA
1	Power Supply	By Owner		SU

Notes: Perimeter gasket by frame manufacturer.
Access control panel and security management software by others.
OPERATION: RF transmitter temporarily unlocks electric strike and cycles operator: automatic relock. Electric strike is fail-secure.

Set: 5.0

Doors: E001, M001, P001

Description: Exterior Electrical Room Exit - NEC

3	Hinge	TA2314 NRP	US32D	MK
1	Exit Device (rim, classroom)	7150 AU626F Knurling	630	YA
1	Cylinder Guard Ring	By Owner	26D	KD
1	Cylinder	By Owner	626	SC
1	Surface Closer	5821T	689	YA
1	Threshold	1715AK WS10SS		PE
1	Gasketing	S88D		PE
1	Sweep	315CN TKSP8		PE

Set: 6.0

Doors: M111
Description: Rated Electrical Room Exit - NEC

3	Hinge	TA2714 NRP	US26D	MK
1	Exit Device (rim, classroom)	7150F AU626F Knurling	630	YA
1	Cylinder Guard Ring	By Owner	26D	KD
1	Cylinder	By Owner	626	SC
1	Door Closer	5821	689	YA
1	Wall Stop	409	US32D	RO
1	Gasketing	S88D		PE

Notes: 5" hinges required at openings wider than 36".

Set: 7.0

Doors: M200C
Description: Passage/Exit

3	Hinge (heavy weight)	T4A3786 NRP	US26D	MK
1	Exit Device (rim, passage)	7150 AU628F	630	YA
1	Door Closer	5801 (PULL SIDE MT)	689	YA
1	Kick Plate	K1050 8" High	US32D	RO
1	Wall Stop	409	US32D	RO
3	Silencer	608		RO

Set: 8.0

Doors: S-M2-2, S-M2-3
Description: Rated Passage/Exit

3	Hinge (heavy weight)	T4A3786 NRP	US26D	MK
1	Exit Device (rim, passage)	7150F AU628F	630	YA
1	Door Closer	5801 (PULL SIDE MT)	689	YA
1	Kick Plate	K1050 8" High	US32D	RO
1	Wall Stop	409	US32D	RO
1	Gasketing (head & jambs)	315CR TKSP8		PE

Set: 9.0

Doors: S-E1-1A, S-E1-2A, S-E1-3A, S-E2-1A, S-E2-2A, S-E2-3A, S-M1-1A, S-M1-2A, S-M1-3A, S-P1-1A, S-P1-2A, S-P1-3A, S-P2-1A, S-P2-2A, S-P2-3A
Description: Rated Passage/Exit with Magnetic Wall Holder

3	Hinge (heavy weight)	T4A3786 NRP	US26D	MK

1	Exit Device (rim, passage)	7150F AU628F	630	YA
1	Door Closer	5801 (PULL SIDE MT)	689	YA
1	Kick Plate	K1050 8" High	US32D	RO
1	Electromagnetic Holder	998	689	RF
1	Gasketing (head & jambs)	315CR TKSP8		PE

Notes: Prep frame header for future installation of Norton 5700 handicap operator at openings S-E1-1A & S-P1-1A. Provide attached mortar box per unit template. Run conduit to mortar box.

Set: 10.0

Doors: M110

Description: Classroom Function - Mail Room

3	Hinge	TA2714 NRP	US26D	MK
1	Cylindrical Lock (classroom)	QL87 SB	26D	AW
1	Cylinder Guard Ring	By Owner	26D	KD
1	Cylinder	By Owner	626	SC
1	Surface Closer	5821T	689	YA
3	Silencer	608		RO

Notes: Card reader access control panel and security management software by others.
OPERATION: Outside card reader temporarily unlocks electric strike: automatic relock. Electric strike is fail-secure. Lock is storeroom function: outside lever is always rigid, key retracts latch, inside lever always allows egress.

Set: 11.0

Doors: A3

Description: Passage Function

3	Hinge	TA2714	US26D	MK
1	Cylindrical Lock (passage)	QL01 SB	26D	AW
1	Wall Stop	409	US32D	RO
3	Silencer	608		RO

Notes: Verify compatibility with existing conditions.

Set: 12.0

Doors: D1, G

Description: Passage Function

3	Hinge	TA2714	US26D	MK
1	Cylindrical Lock (passage)	QL01 SB	26D	AW
1	Wall Stop	409	US32D	RO
3	Silencer	608		RO

Set: 13.0

Doors: M200D

Description: Rated Passage Function with Closer

3	Hinge (heavy weight)	T4A3786 NRP	US26D	MK
1	Cylindrical Lock (passage)	QL01 SB	26D	AW
1	Door Closer	5821	689	YA
1	Kick Plate	K1050 8" High	US32D	RO
1	Wall Stop	409	US32D	RO
1	Gasketing (head & jambs)	315CR TKSP8		PE

Set: 14.0

Doors: M105A

Description: Exterior Aluminum Card Access / Exit Pair

2	Continuous Hinge	CFS83HD1 Cut to Req'd Length		PE
1	Keyed Removable Mullion	KRM200	600	YA
1	Exit Device (rim,	7150 EO ECK1	630	YA
1	Exit Device (rim, nightlatch)	7150 632F ECK1	630	YA
1	Cylinder	By Owner	626	SC
1	Rim Electric Strike	4801	US32D	TR
2	Door Closer	5821	689	YA
1	Kick Plate	K1050 8" High	US32D	RO
1	Wall Stop	409	US32D	RO
1	Threshold	1715AK WS10SS		PE
2	Sweep	315CN TKSP8		PE
3	Silencer	608		RO
1	Card Reader	By Owner		SA
1	Power Supply	By Owner		SU

Notes: Minimum 5" wide stiles required.
Access control panel and security management software by others.
OPERATION: RF transmitter temporarily unlocks electric strike and cycles operator: automatic relock.
Electric strike is fail-secure.
Verify hardware compatibility with existing conditions.
Remove existing surface closer, exit device, threshold and sweep and replace as scheduled.

Set: 15.0

Doors: S-E1-1B, S-E1-2B, S-E1-3B, S-E2-1B, S-E2-2B, S-E2-3B, S-M1-1B, S-M1-2B, S-M1-3B, S-M2-1B, S-P1-1B, S-P1-2B, S-P1-3B, S-P2-1B, S-P2-2B, S-P2-3B

Description: Rated Passage Function with Magnetic Wall Holder

3	Hinge	TA2714 NRP	US26D	MK

1	Cylindrical Lock (passage)	QL01 SB	26D	AW
1	Door Closer	5801 (PULL SIDE MT)	689	YA
1	Kick Plate	K1050 8" High	US32D	RO
1	Electromagnetic Holder	998	689	RF
1	Gasketing (head & jambs)	315CR TKSP8		PE

Set: 16.0

Doors: D2
Description: Laundry Pair - Roller Latches

6	Hinge	TA2714	US26D	MK
2	Roller Latch	592	US26D	RO
2	Door Pull	106	US32D	RO
2	Silencer	608		RO

Set: 17.0

Doors: M107-1
Description: Office with Closer

3	Hinge	TA2714 NRP	US26D	MK
1	Cylindrical Lock (entry)	QL81 SB	26D	AW
1	Cylinder Guard Ring	By Owner	26D	KD
1	Cylinder	By Owner	626	SC
1	Door Closer	5801 (PULL SIDE MT)	689	YA
1	Kick Plate	K1050 8" High	US32D	RO
1	Wall Stop	409	US32D	RO
3	Silencer	608		RO

Notes: Verify compatibility with existing conditions.

Set: 18.0

Doors: C1A, C2, C3
Description: Privacy Function

3	Hinge	T2314	US32D	MK
1	Cylindrical Lock (privacy)	QL02 SB	26D	AW
1	Wall Stop	409	US32D	RO
3	Silencer	608		RO

Set: 18.1

Doors: C1, E
Description: Privacy Function

3	Hinge	T2314	US32D	MK
1	Cylindrical Lock (privacy)	QL02 SB	26D	AW
1	Wall Stop	409	US32D	RO
3	Silencer	608		RO

Notes: Verify compatibility with existing conditions.

Set: 19.0

Doors: M109
Description: Privacy Function with Closer

3	Hinge	TA2314 NRP	US32D	MK
1	Cylindrical Lock (privacy)	QL02 SB	26D	AW
1	Door Closer	5821	689	YA
1	Kick Plate	K1050 8" High	US32D	RO
1	Wall Stop	409	US32D	RO
1	Gasketing	S88D		PE

Notes: Verify compatibility with existing conditions.

Set: 20.0

Doors: B1, B1A, B2A
Description: Entry Function - Bedroom

3	Hinge	TA2714 NRP	US26D	MK
1	Cylindrical Lock (entry)	QL81 SB	26D	AW
1	Logic Cylinder	By Owner	26	MC
1	Cylinder Guard Ring	By Owner	26D	KD
1	Wall Stop	409	US32D	RO
3	Silencer	608		RO

Notes: Verify compatibility with existing conditions.

Set: 21.0

Doors: H, M200E
Description: Mechanical Room

3	Hinge	TA2714 NRP	US26D	MK

1	Cylindrical Lock (storeroom)	QL82 SB TACTILE OS	26D	AW
1	Cylinder Guard Ring	By Owner	26D	KD
1	Cylinder	By Owner	626	SC
1	Surface Overhead Holder	10-X26	652	RF
1	Gasketing (head & jambs)	315CR TKSP8		PE

Set: 21.1

Doors: M108
Description: Mechanical Room

3	Hinge	TA2714 NRP	US26D	MK
1	Cylindrical Lock (storeroom)	QL82 SB TACTILE OS	26D	AW
1	Cylinder Guard Ring	By Owner	26D	KD
1	Cylinder	By Owner	626	SC
1	Surface Overhead Holder	10-X26	652	RF
1	Gasketing (head & jambs)	315CR TKSP8		PE

Notes: Verify compatibility with existing conditions.

Set: 22.0

Doors: M107A
Description: Storeroom Function with Closer - IT Room

3	Hinge	TA2714 NRP	US26D	MK
1	Cylindrical Lock (storeroom)	QL82 SB	26D	AW
1	Cylinder Guard Ring	By Owner	26D	KD
1	Cylinder	By Owner	626	SC
1	Door Closer	5801 (PULL SIDE MT)	689	YA
1	Kick Plate	K1050 8" High	US32D	RO
1	Wall Stop	409	US32D	RO
3	Silencer	608		RO

Notes: Verify compatibility with existing conditions.

Set: 23.0

Doors: A2
Description: Apartment Entry with ADA Operator

3	Hinge	TA2714 NRP	US26D	MK
1	Cylindrical Lock (entry)	QL81 SB	26D	AW
1	Logic Cylinder	By Owner	26	MC
1	Cylinder Guard Ring	By Owner	26D	KD
1	Electric Strike	EN 400	US32D	TR
1	Automatic Operator	5730 SN-134	689	NO

1	RF Kit (Enforcer)	SK-910RBQ x (2) SK-919TP4J-NUQ		EN
1	Kick Plate	K1050 8" High	US32D	RO
1	Wall Stop	409	US32D	RO
1	Gasketing (head & jambs)	315CR TKSP8		PE
2	Viewer	622	US26D	RO

Notes: Verify compatibility with existing conditions.
OPERATION: RF transmitter temporarily unlocks electric strike and cycles operator: automatic relock. Electric strike is fail-secure.

Set: 24.0

Doors: A1

Description: Rated Entry Function - Apartment Entry

3	Hinge	TA2714 NRP	US26D	MK
1	Cylindrical Lock (entry)	QL81 SB	26D	AW
1	Logic Cylinder	By Owner	26	MC
1	Cylinder Guard Ring	By Owner	26D	KD
1	Door Closer	5801 (PULL SIDE MT)	689	YA
1	Kick Plate	K1050 8" High	US32D	RO
1	Wall Stop	409	US32D	RO
1	Gasketing (head & jambs)	315CR TKSP8		PE
1	Viewer	622	US26D	RO

Notes: Verify compatibility with existing conditions.

Set: 25.0

Doors: E100E, E200E, P100E, P200E

Description: Storeroom Function Pair - IT Closet

6	Hinge	TA2714 NRP	US26D	MK
2	Flush Bolt	555 12"	US26D	RO
1	Dust Proof Strike	570	US26D	RO
1	Cylindrical Lock (storeroom)	QL82 SB	26D	AW
1	Cylinder Guard Ring	By Owner	26D	KD
1	Cylinder	By Owner	626	SC
2	Surface Overhead Holder	10-X26	652	RF
2	Silencer	608		RO

Notes: Overlapping astragal by door manufacturer.
Verify compatibility with existing conditions where material is reused.

Set: 25.1

Doors: S-E1-1D, S-P1-1D
Description: Storeroom Function Pair - IT Closet

6	Hinge	TA2714 NRP	US26D	MK
2	Flush Bolt	555 12"	US26D	RO
1	Dust Proof Strike	570	US26D	RO
1	Cylindrical Lock (storeroom)	QL82 SB TACTILE OS	26D	AW
1	Cylinder Guard Ring	By Owner	26D	KD
1	Cylinder	By Owner	626	SC
2	Surface Overhead Holder	10-X26	652	RF
2	Silencer	608		RO

Notes: Overlapping astragal by door manufacturer.
Verify compatibility with existing conditions where material is reused.

Set: 26.0

Doors: E300C, E300F, M300C, M300E, P300C, P300F
Description: Rated Elevator Equipment Pair

2	Hinge	TA2714 NRP	US26D	MK
4	Hinge (spring)	1502 4-1/2" x 4-1/2"	US26D	MK
2	Flush Bolt	555 12"	US26D	RO
1	Dust Proof Strike	570	US26D	RO
1	Cylindrical Lock (storeroom)	QL82 SB TACTILE OS	26D	AW
1	Cylinder Guard Ring	By Owner	26D	KD
1	Cylinder	By Owner	626	SC
1	Coordinator	1700 Wear Plates	US28	RO
1	Gasketing (head & jambs)	315CR TKSP8		PE
1	Astragal Seal	S771D		PE

Notes: Overlapping astragal by door manufacturer.

Set: 27.0

Doors: E002, P002
Description: Exterior Storeroom Function - IT Room

3	Hinge	TA2314 NRP	US32D	MK
1	Cylindrical Lock (storeroom)	QL82 SB	26D	AW
1	Cylinder Guard Ring	By Owner	26D	KD
1	Cylinder	By Owner	626	SC
1	Surface Closer	5821T	689	YA

1	Threshold	1715AK WS10SS		PE
1	Gasketing (head & jambs)	315CR TKSP8		PE
1	Sweep	315CN TKSP8		PE

Set: 28.0

Doors: B2

Description: Entry Function Bedroom with Handicap Closer

3	Hinge	TA2714 NRP	US26D	MK
1	Cylindrical Lock (entry)	QL81 SB	26D	AW
1	Logic Cylinder	By Owner	26	MC
1	Cylinder Guard Ring	By Owner	26D	KD
1	Electric Strike	EN 400	US32D	TR
1	Automatic Operator	5730 SN-134	689	NO
1	RF Kit (Enforcer)	SK-910RBQ x (2) SK-919TP4J-NUQ		EN
1	Wall Stop	409	US32D	RO
3	Silencer	608		RO

Notes: OPERATION: RF transmitter temporarily unlocks electric strike and cycles operator: automatic relock. Electric strike is fail-secure.

Set: 29.0

Doors: M107-2

Description: Existing Office with Added Card Access

1	Cylindrical Lock (storeroom)	QL82 SB	26D	AW
1	Electric Strike	EN 400	US32D	TR
1	Door Closer	5801 (PULL SIDE MT)	689	YA
1	Card Reader	By Owner		SA
1	Power Supply	By Owner		SU

Notes: Balance of existing hardware to remain.
Access control panel and security management software by others.
OPERATION: Outside card reader temporarily unlocks electric strike: automatic relock. Electric strike is fail-secure.

Set: 30.0

Doors: M106-2

Description: Existing Exterior Aluminum Card Access Exit with Added Handicap Operator

1	Continuous Hinge	CFS83HD1 Cut to Req'd Length		PE
1	Exit Device (rim, nightlatch)	7150 632F ECK1	630	YA
1	Logic Cylinder	By Owner	26	MC
1	Cylinder Guard Ring	By Owner	26D	KD
1	Rim Electric Strike	4801	US32D	TR

1	Door Closer	5821	689	YA
1	Automatic Operator	5730 SN-134	689	NO
1	RF Kit (Enforcer)	SK-910RBQ x (2) SK-919TP4J-NUQ		EN
1	Threshold	1715AK WS10SS		PE
1	Sweep	315CN TKSP8		PE
1	Card Reader	By Owner		SA
1	Power Supply	By Owner		SU

Notes: Verify compatibility with existing conditions.
Access control panel and security management software by others.
OPERATION: RF transmitter temporarily unlocks electric strike and cycles operator: automatic relock. Electric strike is fail-secure.
Verify hardware compatibility with existing conditions.
Remove existing surface closer, exit device, threshold and sweep and replace as scheduled.

Set: 31.0

Doors: S-M2-1A
Description: Rated Passage/Exit with Magnetic Wall Holder

1	Continuous Hinge	CFM83HD1		PE
1	Exit Device (rim, passage)	7150F AU628F	630	YA
1	Door Closer	5801 (PULL SIDE MT)	689	YA
1	Kick Plate	K1050 8" High	US32D	RO
1	Electromagnetic Holder	998	689	RF

Notes: Perimeter gasket by frame manufacturer.

Set: 32.0

Doors: E003, E004, E005, M002, M003, P003, P004, P005
Description: Existing Door and Frame - New Cylinder

1	Cylinder Guard Ring	By Owner	26D	KD
1	Cylinder	By Owner	626	SC

Notes: Balance of existing hardware to remain.

Set: 33.0

Doors: F
Description: Existing Closet Slide-by Pair

2	Flush Pull	94	US26D	RO

Notes: Balance of existing hardware to remain.

Set: 34.0

Doors: S-E1-3C, S-M1-3C, S-P1-3C

Description: Metal Gate

2	Cylinder	By Owner	626	SC

Notes: Balance of hardware by gate manufacturer. Coordinate cylinder requirements with gate manufacturer.

Set: 35.0

Doors: J

1	Logic Cylinder	By Owner	26	MC
1	Cylinder Guard Ring	By Owner	26D	KD

Notes: Balance of hardware by door manufacturer.

END OF SECTION

ITS Telecommunications Standards -

Specifications Manual for Construction and Renovations

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ATTACHMENTS:

The attachments provide assistance for base design details to the project RCDD and design teams. Attachments in this document provide details for the following:

- **Attachment 1**: UNC Charlotte ITS RCDD requirements document
- **Attachment 2**: UNC Charlotte ITS Bid Alternate Materials List

PHOTOS:

- **Appendix A:** Telecommunications equipment racks
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UNIVERSITY OF NORTH CAROLINA CHARLOTTE
INFORMATION TECHNOLOGY SERVICES DEPARTMENT
MISSION STATEMENT

The University of North Carolina Charlotte Information Technology Services (ITS) Department is responsible for a wide variety of technology based systems along with the supporting infrastructure for the campus community. The campus community currently consists of approximately 27,000 students and 3,500 faculty and staff employees (October 2014), all requiring reliable, high speed data and voice network services.

The UNC Charlotte campus has well over 80 buildings ranging from academic or business office buildings, research, athletic, resident life, dining, parking deck structures, and university support facilities. UNC Charlotte ITS supports a wide array of technology based systems, some of which are listed below and required to support the facilities and their occupants.

- Primary data center(s) supporting the campus wide data network
- Network equipment systems
- VoIP systems
- Wireless Access Points
- POE IP camera systems
- Multi-story building structured cabling systems
- Underground telecom infrastructure systems
- Outside plant fiber optic and copper cable distribution systems
- Code Blue emergency phone systems
- Residence Life CATV and internet fiber optic interconnection and trunk line systems

The campus community demands on the ITS Department requires a robust reliable network, 24X7, 365 days a week. To provide the level of services required, ITS must establish a cabling and network infrastructure system that meets the requirements and guidelines of the industry. This document will outline specific criteria which are required to perform a telecommunications design and deployment on the UNC Charlotte campus.

The UNC Charlotte ITS Department is committed to providing a high level of service the campus community has come to rely on. In order to achieve this initiative, ITS routinely works with university capital project and construction management teams, architectural design firms, Registered Communications Distribution Designer (RCDD), and other supporting teams who are contracted to provide telecommunications services on UNC Charlotte construction projects. ITS also promotes this initiative through other internal university design projects issued by the Design Services department in our Facilities Management building. It is intended that with the specific guidelines being presented in this document, along with compliance with the UNC Charlotte Design and Construction Manual, that all telecommunications projects on the campus be implemented successfully.

SECTION 1: REGISTERED COMMUNICATIONS DISTRIBUTION DESIGNER (RCDD) REQUIREMENTS AND RESPONSIBILITIES

The RCDD requirements document defines the responsibilities of the RCDD for any UNC Charlotte construction project that requires their professional services. It is also located in ***Attachment 1*** of this document.

Below is the link to the university Design and Construction Manual.

http://facilities.uncc.edu/our-services/business-related-services/facilities-planning/design-and-construction-manual

SECTION 2: HORIZONTAL TWISTED PAIR STRUCTURED CABLING AND DEPLOYMENT CATEGORIES

Horizontal cabling systems:

UNC Charlotte ITS has the responsibility for managing the horizontal (unshielded twisted pair) structured cabling deployments for the campus. UNCC ITS maintains a standardized horizontal structured cabling system consisting of Commscope cables and The Siemon Company termination hardware.

Horizontal structured cabling systems deployed require 20 year product installation and applications based warranties. The Siemon Company is responsible for providing warranties for the partnering cable solution installed and they require specific installation criteria in order to be in the Siemon cable warranty program. Siemon requires a Certified Installer (CI) to perform the cabling installations in order to qualify for the 20 year cable warranties. Non Siemon CI telecom installation companies cannot install nor provide the required 20 year cable warranties.

UNC Charlotte ITS currently posts and maintains a standardized bid alternate material list document that is to be issued on all UNC Charlotte bid projects requiring telecommunications cabling unless otherwise directed by ITS. The document provides detailed lists of all base components which UNCC ITS requires on each structured cabling deployment. This document will be updated as required. Each project issuing the bid alternate material list will be provided the most current edition at time of project design and bid.

Please see UNC Charlotte ITS bid alternate material list in ***Attachment 2*** of this document.

Category of cables:

The current UNC Charlotte ITS horizontal unshielded twisted pair structured cabling system deployment consist of Category 6 and Category 6A cables.

The primary system deployed on all projects for voice and data applications will be the Category 6 horizontal structured cabling system unless otherwise directed by UNC Charlotte ITS. This system is to be installed utilizing a “home run” method between the telecom room serving the area of installation and the telecom outlet in the field unless otherwise directed by project documentation.

The installation of Category 6A cabling systems will be utilized in specific areas within a facility that may require higher bandwidth applications this cabling system would provide. Typically these areas would consist of research labs, high end computing labs, server rooms, etc. The use of Category 6A cable in these areas and any other area in a facility will be determined during the design of a facility.

UNCC ITS will allow the use of a gel flooded Category 6 twisted pair cable in specific applications. These applications consist of installations where moisture could be present in the cable pathway and a dry plenum rated twisted pair cable cannot be installed. ITS will allow the use of transition points for changeover of flooded cable to dry cable when required in a facility. The proper rated termination block(s) will be required pending category of cable being transitioned. Typical Category 6 transitions utilize a 210 style termination block.

Specialty cables other than what are listed in the bid alternate material list document will be addressed on a building by building basis during the design of a facility. It is the responsibility of the RCDD telecom designer to address these cables with UNCC ITS during facility design.

All twisted pair cables must be rated for the environment they are installed within.

Cable count requirements:
UNC Charlotte ITS standard telecommunications outlet is to be provided with two (2) Category 6 or two (2) Category 6A cables unless the outlet location requires additional cables due to the installation environment. Outlets requiring more than two (2) cables are to be detailed on the project symbol legend showing the correct amount of cables required.

ITS requires that offices in facilities receive a minimum of one (1) telecommunications outlet on the opposing side walls. These outlets are to be detailed during the project design process with furniture lay outs considered while placing outlets. Each outlet is to receive two (2) cables with unused faceplate ports blanked off. If a specific project design is required to provide value engineering in order to bring a project into budget, one side wall with two (2) cables in the faceplate can be deleted if the occupant can operate on a single telecommunications outlet with only two (2) cables in the office. However, ITS would require that the additional outlet box with conduit be installed for future telecommunications cabling and be provided a blank faceplate to be installed by the project.

Cable termination requirements:
UNC Charlotte ITS requires all Category 6 UTP cables be terminated on individual RJ-45 jacks at the outlet and at the patch panel utilizing the 568-A termination schematic. All Category 6A UTP cables are required to be terminated on the proper RJ-45 Z-Max jack at the outlet and patch panel utilizing the 568-A termination schematic.

Telecommunications outlets in the field are to be white double gang 6 port faceplates for the category cable installed unless otherwise directed. Faceplates are to be populated with white RJ-45 type jacks with matching flip up door cover that will accept a slide in designation icon. Unused white faceplate ports are to be provided with white blanks. Other termination housings such as surface mount boxes are to be white with white RJ-45 jacks as required. Category 6A outlet jacks are not equipped with flip up doors that hold the color icon. The jacks have a color cover with a location in which to place a colored icon.

Category 6 cables terminated in the telecommunications rooms are to receive black jacks installed in unpopulated black patch panels rated to accept the cable installed. Z-Max patch panel jacks will be the standard gray color only that come in the patch panel/jack termination kit for telecom room terminations.

Color coded icon systems are required on the horizontal cable installs at the outlet and the patch panel. The color coded icons provide the designation of use for the cable installed in the faceplate and patch panel. The icon color code chart is provided in the UNCC ITS bid alternate material list - ***Attachment 2*****.**

Cable installation environments:
Typical telecommunications outlets should be installed in an environment which provides protection from moisture and dirt infiltration, utilizing dry plenum rated overhead horizontally installed cabling to the outlet.

Telecommunications outlets that are installed in areas where moisture can build up and water applications are utilized for wash downs, or food service and industrial equipment environments where

outlets are exposed to the elements, require the Siemon Industrial Max series jack and faceplate termination system. Dry or gel flooded cables can be terminated on the Industrial Max jacks.

All cables, cable terminations, and cable termination housings are to be rated for the environments in which they are installed.

SECTION 3: ITS STRUCTURED CABLING - INFRASTRUCTURE SUPPORT SYSTEMS

Conveyance Systems:

UNC Charlotte ITS accepts various methods of cable support infrastructure systems. These systems can range from the following:

- Wire basket cable tray systems
- J-Hook tree systems
- Steel telecom ladder racking systems (primarily in telecom rooms)
- Aluminum cable tray systems
- Conduits and conduit sleeves
- Wire Mold systems
- Poke through and in slab floor boxes

Other cable tray systems or specialty conveyance systems can be reviewed on a building by building basis if the systems listed will not provide the required cable conveyance support infrastructure.

All cable tray system or specialty conveyance systems must be installed utilizing all factory components related to the environment the installation is performed in or passes through. Conveyance systems must be installed with structures rated to support the system and with the system fully loaded. J-Hook systems supported by overhead wire must convert to overhead threaded rod supports when more than two 4" J-Hooks are applied to a single overhead support.

All cable tray or specialty conveyance systems must be sized to accommodate the base installation of cabling within a facility. Conveyance systems must accommodate 40% cable growth potential beyond the base installation.

Projects are not limited to one type of conveyance system but can utilize a combination of cable conveyance systems to provide proper cable support within a facility. All systems installed must comply with telecommunications industry standards requirements regarding spacing of supports and type of cables that can be installed within the supports provided.

Cable tray systems should not be installed through fire walls or areas that are not accessible. Conduit pathways or conduit sleeve systems can be utilized for these applications. Sufficient conduits or sleeves are required to accommodate base installation plus 40% growth potential. UNC Charlotte ITS supports the use of EZ-Path telecom fire rated sleeve systems be installed when applicable through fire rated wall penetrations. The EZ-Path sleeve systems provide a fire rated solution out of the box without requiring additional time consumption and inadequate fire rating efforts on standard conduit sleeves. In time, these sleeves will get over filled with cables and the fire rating will be non-compliant.

Some facilities may require separate sleeve systems for different cable types on a project. These sleeve systems are to be provided with a color coding system applied to the conduit by the project contractors. The color code system is to be detailed in project documentation for the specific project installation.

UNCC ITS prefers in slab floor boxes rather than poke throughs for both Category 6 and Category 6A cables. Poke throughs designed and accepted for a project sharing telecom and electrical connections should be no less than 10" in diameter. Category 6A cables cannot be installed in poke throughs unless the poke through is specifically designed to accommodate a category 6A cable install with the proper bend radii and required structured cabling system termination hardware.

Telecommunications Outlet Infrastructure Requirements:

UNC Charlotte ITS requires sufficient telecommunications outlets be programmed in the design of a facility to supply adequate voice and data connectivity to the occupants. Amounts of cables and outlets required within a facility will be determined during early programming meetings with the designers and occupants.

All standard ITS Category 6 UTP telecommunications outlets, unless otherwise directed, are provided with a double gang back box and a double gang plaster ring with a 1" conduit home run from the outlet box to the hallway cable conveyance system. The 1" conduit should end within 10" to 12" of the hallway cable conveyance system. The 1" conduit installed in a home run fashion can support up to 4 Category 6 cables without exceeding fill rates in the conduit. If an individual Category 6 outlet requires more than 4 cables, an additional 1" conduit will be required from the outlet to the hallway conveyance system.

The standard ITS telecom double gang outlet will be trimmed out with a double gang 6 port faceplate with the unused jack openings provided with blank covers.

Other ITS telecom outlets provided in a facility may not require the double gang plaster ring with double gang faceplate set up as the standard outlet. Some outlets will require a single gang plaster ring be installed on the double gang back box with the 1" conduit to accessible pathways. The outlet would be trimmed out with a single gang faceplate. These locations are typically public access phones, millwork applications where a double gang faceplate would not be feasible, etc.

Some ITS outlets will be installed in wire mold systems or other type metal conveyance and termination system. ITS requires the decora type insert be provided with the required amount of jack openings in these applications with the correct trim ring applied. These outlets are to be color coordinated with the conveyance/termination system they are being installed in.

- Example – Brushed stainless = Gray insert with gray jacks and gray trim ring
- Example – Tan or Ivory = Ivory insert with ivory jacks and ivory trim ring
- Example – White = White insert with white jacks and white trim ring

The installation of a Category 6A UTP cable system will not utilize the same conveyance infrastructure from the outlet to the hallway conveyance systems as a Category 6 cable. Category 6A cable installations require more bend radius area for the cable than a standard Category 6 cable installation. Category 6A cable installs will require the utilization of an open architecture support system to the outlet location from the hallway conveyance system such as a J-Hook system.

A 1-1/4" EMT conduit is to be attached to the wall stud structure and stubbed up above the wall top plate inside the wall cavity where the telecom outlet would be installed. Install the 1-1/4" conduit to where the outlet opening will be and stop conduit. Place plastic bushings on each end of the conduit. Provide a pull string from the outlet opening thru the 1-1/4" stubbed up conduit and tie off above ceiling for use by the telecom contractor. Telecom contractor is to replace string when cable installation is complete.

In lieu of installing a standard double gang back box with double gang plaster ring to house the telecom cable jack terminations, a double gang box eliminator can be provided. The box eliminator, when installed, should be the type that will not allow any movement after installation and when the faceplate with jacks is attached.

Category 6A UTP cables are to be installed in wire mold or other enclosed conveyance systems with termination locations within. The enclosed conveyance system will need to be sized properly to accommodate the 6A UTP cabling and termination systems.

Any other area of a facility in which Category 6A UTP cables would be required and cannot be delivered in a standard conveyance system will be addressed on a case by case basis.

Labeling requirements:

UNCC ITS requires that labeling systems be applied to all telecommunications installs as per minimum EIA – TIA labeling requirements and UNCC ITS specific requirements. The RCDD will be responsible for providing the industry standard labeling requirements in the telecom bid documentation and to provide detailed drawings showing labeling fields on the specific devices they are applied to.

Typical faceplate labeling will show the following: Tel Room #, Rack #, PP letter, PP Port #(s).
Example: 101-R1-A-24,25

Patch Panel systems will utilize a letter assignment in the rack they reside in. The letters will start at **A** and continue down the rack **(example: R2)** to the last patch panel in the rack. When starting a new rack of patch panels the letters will start over at **A** again and relate to the rack number **(example: R4)** the patch panel is installed in. **UNCC requires that patch panel installations in a single rack do not exceed 9 panels.**

Other specific labeling systems not covered by industry standards or by ITS will be addressed as required during project design.

Please refer to ***Appendix F*** for photo examples of the various outlet configurations on campus.

SECTION 4: TELECOMMUNICATIONS ROOM REQUIREMENTS

Main Distribution Frame room requirements (MDF):

UNCC ITS, when applicable, requires standard division of the main distribution frame (MDF) and intermediate distribution frame (IDF) rooms. The MDF can be located in various spaces within a facility, but is typically located on the lowest level of a facility in a central floor space area to accommodate IDF stacked room(s) on other floors located above.

MDF is to serve the following primary purpose:

- Provide outside plant conduit duct bank entrance
- Provide outside plant copper and fiber optic termination points
- Provide equipment racks and/or equipment cabinets to house primary building serving electronics
- Provide primary termination point for building copper, fiber optic, and CATV riser systems
- Provide primary termination point for telecommunications room(s) grounding riser system

Horizontal twisted pair structured cabling systems are not typically installed to the MDF. Some facilities due to either their size or floor plan may require the MDF be combined with an IDF as a shared entity. If the MDF is required to become a shared space with an IDF, the room will have to be placed to accommodate telecommunications industry standards for the length of the horizontal cabling being installed. Shared rooms will be considered on a facility by facility design basis as requirements dictate.

MDF is not to house the following electronics based facility services unless otherwise noted:

- Open Options access panels (per facility basis)
- Fire alarm panel equipment (fiber optic communications link terminations only)
- Security systems
- Area of Rescue systems
- Energy monitoring systems
- Video head end equipment (per facility basis)
- Video recording equipment – NVR
- Any other peripheral electronic based building service device not pre-approved by ITS

MDF is to be sized and equipped with the following infrastructure:

- MDF is to be sized to accommodate a minimum of four (4) equipment racks placed in a single file row with 12” vertical wire managers between each rack and on the side rail of each end rack. Some telecom rooms may require additional equipment racks. This will be determined on a facility by facility basis.
- Clearance from front and back of standard equipment racks with wire management systems to the walls should be minimum of 48” from the outside of the mounting foot on the front and back of the equipment rack to the wall it faces.
- There should be a minimum 48” of clearance on at least one side between the last rack side wire manager or equipment cabinet and/or combination of both, and the side wall of the telecom room for access to back of the row.
- Some MDF telecom rooms may require a hybrid system of equipment racks and enclosed equipment cabinets due to security reasons. The UNCC ITS bid alternate material list contains part number(s) for enclosed cabinet(s). When installing a hybrid system or a complete enclosed equipment cabinet install, proper clearances must be maintained for front and rear access of the enclosed equipment cabinet chosen for a project.

- All walls in the MDF are to be covered with ¾" fire retardant plywood with the AC Grade side of plywood showing. All fire retardant stamped bands are to be left exposed on all sheets of plywood installed. Plywood is not to be painted. Plywood to be installed from 6"AFF to 8'6"AFF.
- Floors can be left with a smooth sealed concrete finish that will not allow future shedding of the concrete. Some rooms may require epoxy paint seal on the floor or non-static VCT tile. This will be determined on room by room basis during project design.
- All walls of the MDF are to receive a minimum of ***one (1) Duplex 120 VAC, 20 AMP 5-20R outlet***.
- Specific power outlets are required over the MDF equipment racks and cabinets and are to be mounted directly to the overhead steel cable runway. Each equipment rack or enclosed equipment cabinet that houses ITS electronics will get the following: ***One (1) 208 VAC, 30 AMP L6-30R twist lock receptacle tied to building generator stand by power system; Three (3) 208 VAC, 20 AMP L6-20R twist lock receptacles tied to standard building power***. In some housing or specialty buildings, the IDF may be required to have ***125 VAC, 30 AMP L5-30R twist lock receptacles*** instead and will be identified during project design.
- There are to be no ceilings in the MDF except when required to meet dry or gas operated fire suppression system codes for containment.
- Telecom rooms need to meet minimum or required fire suppression codes for room type.
- MDF to receive sufficient lighting to cover the entire room placed at proper intervals within the room and mounted at a minimum of 24" above steel cable runway system.
- MDF to receive sufficient air conditioning systems to support room systems and functions. The size and type of air unit(s) are to be determined by room use along with electronic equipment BTU output estimates. BTU ranges are currently between 12,400 and 21,800 BTU/Hr and greater.
- MDF to have sufficient steel telecom runway systems installed around the perimeter of the room and over the equipment racks and/or cabinets to support the base cable installation with 40% growth potential. Runway is to be installed at a height of 7'6"AFF utilizing runway elevation kits on the equipment racks and cabinets. Runway systems are to be installed using all factory rated components to provide a complete runway system within the room conditions it is installed. Runway system is to be completely grounded.
- Standard equipment rack setups are to be installed utilizing 12" vertical wire managers in-between each rack and on the side rail of each end rack unless some rooms may dictate that 6" vertical wire managers be installed. 6" w/m determined on a room by room basis during project design.
- Equipment racks to have 6" wide vertical side rails to accommodate the 12" vertical wire managers unless otherwise directed by ITS.
- Equipment racks to be completely grounded and bolted to floor.
- Enclosed equipment cabinets come equipped with internal vertical wire management and are to be completely grounded.

Any deviations from the required installation of four (4) consecutive equipment racks or cabinets in a row due to MDF room size and configuration can be granted if the room will accommodate the minimum standard installations listed above. RCDD telecom designer is responsible for consulting with UNCC ITS for approval of IDF room deviations.

Intermediate Distribution Frame room requirements (IDF):

UNCC ITS requires individual telecommunications serving rooms be installed on each floor of a facility. Some facilities, due to size and footprint, may require additional IDF rooms on each floor. Although not optimal or recommended, the routing of horizontal station cables between floors to the same IDF is utilized where space for IDF rooms are limited. IDF rooms should be oriented on each floor of a facility where they can accept the maximum amount of horizontal structured cabling without exceeding telecommunications industry standards associated with the allowable length of the cable type installed.

IDF rooms are to serve the following purpose:

- Provide termination point for horizontal structured cabling system
- Provide termination point for dedicated copper and fiber optic cable riser feeds
- Provide equipment racks and/or cabinets to house floor serving electronics
- Provide grounding point in telecommunications grounding riser system

IDF rooms are not to house the following electronics based facility services unless otherwise noted:

- Open Options access panels (per facility basis) or other security systems
- Fire alarm panel equipment (fiber optic communications link terminations only)
- Area of Rescue systems
- Energy monitoring systems
- Video head-end equipment (per facility basis)
- Video recording equipment – NVR
- Any other peripheral electronic based building service device not pre-approved by ITS

IDF rooms are to be sized and equipped with the following infrastructure:

- Minimum of two (2) equipment racks placed in a single file row with 12” vertical wire managers between each rack and on the side rail of each end rack. IDF Telecom rooms may require additional equipment racks which will require additional room size and will be determined by the amount of horizontal twisted pair cables installed to the room and future growth potential.
- Clearance from front and back of standard equipment racks with wire management systems to the walls should be a minimum of 48” from the outside of the mounting foot on the front and back of the equipment rack to the wall it faces.
- There should be a minimum 48” of clearance on at least one side between the last rack side wire manager, or equipment cabinet, or combination of both, and the side wall of the telecom room for access to the back of the row.
- IDF telecom rooms may require a hybrid system of equipment rack(s) and enclosed equipment cabinet(s) due to security reasons. The UNCC ITS bid alternate material list contains part numbers for enclosed cabinets. When installing a hybrid system or enclosed equipment cabinet install, proper clearances must be maintained for front and rear access of the enclosed equipment cabinet chosen for a project.
- All walls in the IDF are to be covered with ¾” Fire Retardant plywood with AC Grade side of plywood showing out. All fire retardant stamped bands are to be left exposed on all sheets of plywood installed. Plywood is not to be painted. Plywood to be installed from 6”AFF to 8’6”AFF.
- Floors can be left with a smooth sealed concrete finish that will not allow future shedding of the concrete. Some rooms may require epoxy paint seal on the floor or non-static VCT tile and will be determined on a room by room basis during project design.
- All walls of the IDF are to receive a minimum of ***one (1) Duplex 120 VAC, 20 AMP 5-20R outlet***.

- Specific power outlets are required over the IDF equipment racks and cabinets and are to be mounted directly to the overhead steel cable runway. Each equipment rack or enclosed equipment cabinet that houses ITS electronics will get the following: ***One (1) 208 VAC, 30 AMP L6-30R twist lock receptacle tied to building generator stand by power system; Three (3) 208 VAC, 20 AMP L6-20R twist lock receptacles tied to standard building power***. In some housing or specialty buildings, the IDF may be required to have ***125 VAC, 30 AMP L5-30R twist lock receptacles*** instead and will be identified during project design.
- There are to be no ceilings in the IDF except when required to meet dry or gas operated fire suppression system codes for containment.
- Telecom rooms need to meet minimum required fire suppression codes required for room type.
- IDF to receive sufficient lighting to cover the entire room placed at proper intervals within the room and mounted at minimum of 24" above steel cable runway system.
- IDF to receive sufficient air conditioning systems to support room systems and functions. The size of the air unit is to be determined by room use along with electronic equipment BTU output estimates. BTU ranges are currently between 12,400 and 21,800 BTU/Hr and greater.
- IDF to have sufficient steel telecom runway systems installed around the perimeter of the room and over the equipment racks and/or cabinets to support the base cable installation with 40% growth potential. Runway to be installed at a height of 7'6"AFF utilizing runway elevation kits on the equipment racks and cabinets. Runway system should utilize all factory rated components to provide a complete runway system within the room condition it is installed in and needs to be completely grounded.
- Standard equipment rack set ups are to be installed utilizing 12" vertical wire managers in between each rack and on the side rail of each end rack unless rooms dictate that 6" vertical wire managers are to be installed. 6" wire managers are to be determined on a room by room basis during project design.
- Equipment racks to have 6" wide vertical side rails to accommodate the 12" vertical wire managers unless otherwise directed by ITS.
- Equipment racks to be completely grounded and bolted to floor.
- Enclosed equipment cabinets come equipped with internal vertical wire management and are to be completely grounded.

Deviations from the required installation of two (2) consecutive equipment racks or cabinets in a row due to IDF room size and configuration can be granted if the room will accommodate the minimum standard installations listed above. The RCDD telecom designer is responsible for consulting UNCC ITS for approval of IDF room deviations.

Please refer to ***Appendix A, B, C and D*** of this document for photo examples for this section.

Specialized telecom room requirements:

Specialized telecommunications distribution facilities or specialized telecom rooms can consist of data centers, server rooms, specialized computing node rooms, etc. Facility type and usage would dictate the requirement of specialized telecommunications service rooms. The RCDD telecom designer will be responsible for coordinating with UNCC ITS and providing design criteria and installation oversight to projects requiring these specialized facilities.

Equipment rack and cabinet utilization requirements:
Please refer to ***Appendix A (figure 1) and D (figure 5)*** provided in this manual.

Standard 19" equipment racks and enclosed equipment cabinets (when required) are used to house university electronics and UPS systems, horizontal cable termination systems, and copper and fiber optic cable termination systems. Equipment racks and cabinets can be installed for use by non-campus telecommunications provider entities. Requirements are based on type of facility being constructed and the possible use by non-campus telecommunications provider entities.

Project RCDD telecom designer will be responsible for coordinating with UNCC ITS and providing design criteria and installation oversight to projects requiring non-campus telecommunications provider entity termination housings.

UNCC ITS standard 19" equipment rack with vertical wire management system deployments consists of no less than two (2) 19" racks which will be placed side by side. ***When facing the front of the racks in a two rack configuration the first rack to the left will house electronics and the rack to the right will house patch panel terminations.***

When installing a UNCC ITS standard four (4) rack configuration the same will apply - facing the front of the racks, rack one to the left will contain electronics, rack two will contain patch panels, rack three would contain electronics, and rack four would contain patch panels. If more than four racks are required the same requirements would extend down the rack line.

NOTE: All patch cable patching from electronics to patch panels **"always"** enter or exit to the right. UNCC ITS utilizes chassis electronics with blade technology. Installing patch cords to the left of the electronics will cover the fan blade module and causes issues when performing service or replacement of the module.

When installing enclosed equipment cabinets in lieu of the two (2) standard 19" equipment racks in a side by side method either in a combination of two (2) or four (4), no external wire management systems are required. The cabinets will contain factory installed internal vertical wire managers. The adjoining cabinets' side access panels should be removed for clear internal access between the equipment cabinets. Equipment and patch panel installations along with the patching methods listed above will be required in enclosed equipment cabinets.

When joining an enclosed equipment cabinet to a 19" rack with external vertical wire management, the equipment cabinet can be installed beside the vertical wire manager as close as needed for the space the installation is occurring in. No Physical connection is required between the cabinet and the 19" rack wire manager.

Elevated steel runway systems at the standard of 7'6" are to be installed over the equipment cabinets as the standard 19" rack system deployments require. Hardware for the runway systems is contained in the UNCC ITS telecommunications bid alternate material list.

Fan doors or rack mount fan packs will not be required in the standard equipment cabinet deployment unless usage of cabinet dictates additional air movement is needed. No additional power strips will be required. If required, the fan assisted systems can be added during project design to the bid alternate material list.

SECTION 5: RISER CABLING SYSTEM REQUIREMENTS

Fiber optic riser cable(s) type and installation requirements:

UNC Charlotte ITS requires both Single Mode and Multi-Mode fiber optic cable riser systems be installed within a facility from the MDF to each floor serving IDF. These cables are to be run in a home run method from termination point to termination point with no splices or intermediate break out access points.

The ITS standard fiber cable(s) utilized for building riser applications are to provide a plenum jacketed distribution fiber cable contained in a spiral metal wrapping with plenum coating applied to the spiral metal wrapping. Deviations from the plenum rated armored fiber cable installations require approval from ITS during project design.

ITS base SM and MM fiber cable riser systems consist of a single 12 strand SM fiber cable and a single 12 strand MM 62.5-125 grade fiber cable be installed from the facility MDF to each floor serving IDF in the methods and types listed above. Deviations from the base strand counts can be initiated during the facility design if a facility usage requires additional or less strands than the base requirement. Some facilities due to use and size may require high strand count SM and MM fiber cables be installed from the MDF to each first floor serving IDF and then a smaller strand count can be installed from the first floor IDF rooms to the stacked IDF rooms above.

Both SM and MM plenum rated armored fiber riser cables are to be direct terminated to LC connectors utilizing anaerobic adhesive method unless otherwise directed by UNCC ITS during project design. The SM and MM fiber optic riser cables when terminated are to be installed into LC coupler panels for the mode of fiber terminated.

SM and MM fiber cables are to be housed in a single 2RU rack mount fiber optic enclosure at the IDF and can share the same enclosure. When terminating the SM and MM fiber cables in the MDF that feed each IDF individually, each set of SM and MM fiber cables will be terminated in a single 2RU fiber cabinet designated for the IDF the cables feed to. Do not utilize one single cabinet with multiple floors terminated inside the cabinet at the MDF.

UNCC ITS purchases, installs, terminates, tests, and maintains all outside plant fiber optic building entrance cables unless otherwise directed during project design.

Copper riser cable(s) type and installation requirements:

UNCC ITS requires copper multi pair riser cables be installed within the facility from the MDF to each floor serving IDF. The copper riser cables are to be installed in a home run method from termination point to termination point. Copper riser cables are to be plenum rated non-shielded type composition Category 3 rated.

Non-standard or installation specific for environment copper riser cables if required are to be addressed during facility design by the RCDD and ITS.

Copper riser cable pair counts may vary per facility and are to be established by the PRCDD and ITS during the telecommunications design of a facility.

Methods in which the copper riser cables can be installed to provide point to point terminations vary and will be established during project design.

- One method is to home run each copper riser cable between the MDF and the IDF it installs to. The copper riser cable(s) would terminate on a 110 wall field in the MDF. In the IDF, the cable would be ran directly to an analog voice patch panel at the top of the patch panel rack or cabinet. The patch panel would be sized to accommodate the copper riser cable terminated at the patch panel. Typically this will either be a 24 port or 48 port patch panel. Populate the patch panel ports with the accompanying jack and terminate one pair each on the center analog pin out on each of the 24 or 48 jacks populating the patch panels. This home run cable would be a 25 pair cable at a minimum unless specified otherwise during project design.
- The alternative method is to run a higher copper pair count between the MDF to the first serving floor IDF that it installs to. At the MDF, the high pair count cable will terminate on a 110 wall field. At the IDF, also terminate the higher copper pair count on a 110 wall field. From the 110 wall field in the IDF, install a hand off cable to an analog patch panel located in the top of the patch panel rack or cabinet. Repeat termination steps listed in the first method at the patch panel. Additional riser cables can be installed from this 110 wall field to the IDF's stacked above with the terminations performed in the IDF's directly to the rack or cabinet analog patch panel as listed above.

If the two methods listed above will not provide the copper riser cable terminations required on a project, other methods can be addressed during facility design.

UNC Charlotte ITS provides, installs, terminates, tests, and maintains all outside plant copper building entrance cables unless otherwise directed during project design. ITS will install a copper hand off cable from the building entrance protector over to the building riser 110 wall field in the MDF and terminate to provide analog connectivity to the copper riser cable system from an external analog source.

Some facilities may not receive an actual outside plant copper cable feed from an external source. The facility may generate its own analog dial tone utilizing voice gateway devices such as a Cisco VG224 installed in the facility. The analog devices are provided, installed, and brought on line by UNCC ITS. ITS will install the necessary hand off cables from the voice gateways over to the 110 wall field in the facility MDF for analog connectivity to the copper riser system.

UNCC ITS provides all copper cross connects or patches to the building copper riser system in the MDF and in the IDF's.

See ***Appendix B and D (figure 4)*** for photo examples for both cabling riser systems.

SECTION 6: OUTSIDE PLANT INFRASTRUCTURE SUPPORT SYSTEMS

Telecommunications manhole requirements:

UNCC ITS is responsible for design input, implementation, and management of the UNCC campus wide underground manhole system covering approximately 600 acres of interconnected facilities. The manhole systems range from older campus core systems to modern manhole systems currently being installed on campus.

A standard telecommunications manhole is to have inside dimensions of 12'X6'X7' (LXWXH). The manholes are to be engineered and rated for the environment installed in. Proper mastic seal tapes are to be utilized when installing the two halves of the manhole together, in between all concrete extension rings placed on top of the manhole structure, and in between the steel access cover and the last concrete extension ring. The steel access ring placed on top of manhole should accept no smaller than a 32" diameter steel manhole lid rated for the environment installed in.

Telecommunications manhole steel lids are to be cast with the letters "communications" embedded in the casting. Manhole lids will also require flush mount pull up lift handles installed in the lids.

Variances on telecom manhole sizes, types, and access other than the standard manhole system listed are to be determined during design of a specific facility or for the project issued specifically for placing new manholes. ITS must approve any variances from the standard telecommunications manhole required.

Telecommunications manholes are to be cast with duct bank entrance windows with 4" conduit terminators on each end wall and one located in the corner of both side walls on opposite ends of the manhole.

Telecommunications manholes are to have cable racking installed utilizing the factory cast in wall nylon anchor systems placed at specific intervals around the interior of the manhole. Cable racks are to be installed at each of the anchor system verticals cast in the manhole walls. Cable racks can be the standard galvanized metal systems or the new fiberglass systems as long as they are bolted to the proper vertical anchor systems and placed at the proper intervals. All cable racks are to receive the specific cable support arms for the rack type installed. Each vertical rack is to receive a minimum of four (4) cable support arms at 8" long (minimum).

Telecommunications manholes are to receive a drainage system. The system can be accomplished by several methods.

- Draining the telecom manhole into the electrical manhole typically installed as a pair to the telecom manhole. A sump pump system is installed in the electrical manhole to remove the water from the telecom and electrical manholes.
- The installation of a gravity drain from the telecom manhole to a storm sewer or to day light.
- The installation of a sump well beside either the telecom or electrical manholes that both manholes drain to and are pumped out to a source that will remove the water from the area.

Telecommunications manholes are to receive a grounding system inside the manhole connected to a lightning dissipation apparatus installed inside the manhole or to an external source outside the manhole.

Telecommunications manholes should always be designed and installed in areas where they are accessible by vehicle when possible. Refrain placement of manholes in planter beds, vehicle traffic lanes and area topologies where they will be in a natural drainage pathway from rain run-off.

Telecom manhole spacing should not exceed a distance of 450 conduit feet in any run.

The use of stacked factory precast concrete rings with correct mastic sealing tape properly sized for the manhole installed will be accepted. ***Bricking extensions on new telecom manhole entrances will not be permitted.*** Use of bricking will only be allowed when the existing telecom manhole extended access is already bricked and concrete rings cannot be applied properly. If the existing bricked manhole access extension is three (3) feet or less, the brick access extension must be removed and replaced with the proper factory precast concrete extension rings and with a new steel access ring and steel lid (if necessary) to fit the new concrete extension rings.

If a new manhole entrance extension ring systems exceeds 6' in depth before entering the telecom manhole, the use of factory steel step systems bolted to the precast nylon anchor systems in the precast access extension rings will be necessary. The installation of a galvanized ladder will be required from the last steel step to the floor of the manhole. The galvanized ladder should be ordered and installed not to hang straight but at an angle to allow proper access into the manhole.

New telecommunications manholes are to be cleaned out at the end of the project and verified by the responsible project design team and UNCC ITS for acceptance and bid document compliance.

Refer to ***Appendix H*** for photo examples.

Intermediate in ground junction boxes (Quazite boxes):

UNCC ITS requires the deployment of Quazite boxes in smaller scaled telecommunications outside plant installations. The Quazite boxes can range in size and depth depending on the size of the conduits installed to the box and the quantity and size of telecommunications cables to be installed in and through the box that interconnect with other boxes.

When installing underground telecom conduits that require Quazite boxes to be placed as access points, a box will be required at no less than 300 conduit feet intervals.

When installing Quazite boxes for emergency phone installations, the box can share the 110 VAC circuit with the telecom cable as long as the two are divided in the Quazite box with a Nema rated junction box that contains the electrical circuit. Voltage higher than 110 VAC is **NOT** allowed in the Quazite box with the telecom cable.

Quazite boxes should not be placed in elevated areas above where the conduits from the box enter a facility. The boxes should not be installed in areas where water can run or pond over the box. This can cause water entry into the box and allow water into the conduits causing flooding issues in the facility where the conduits enter. If an installation requires the box to be in an area that could cause water entry into the box on a regular basis, the box will have to be equipped with a drain line ran from the box to daylight or the closest storm drain.

Please refer to ***Appendix G*** for photo examples.

Telecommunications duct bank and conduit requirements:

UNCC ITS is responsible for design input, implementation, and management of the campus wide underground encased and non-encased duct bank and conduit bank systems interconnecting the campus telecom manhole and in ground junction box systems. The conduit systems range from older campus core systems to the modern conduit systems now being installed at UNC Charlotte.

Various types of encased telecommunications duct bank systems are installed for projects on the UNCC campus. These systems can range from primary trunk systems, smaller secondary distribution systems feeding off of the primary trunk systems and building entrance systems.

- Primary encased duct bank systems contain a minimum of six (6) four inch (4") conduits placed on required conduit stacking chairs to allow proper concrete coverage.
- Secondary distribution encased duct banks systems to contain no less than four (4) four inch (4") schedule 40 conduits placed on required conduit stacking chairs to allow proper concrete coverage.
- Building entrance encased duct bank system to contain a minimum of three (3) four inch (4") schedule 40 conduits placed on required conduit stacking chairs to allow for proper concrete coverage. Once the conduits go under the building slab system, encasement can stop after the conduits are installed beyond the foundation footer of the facility.

Non-encased conduit systems consist of the following but are not limited to:

- Conduit systems for pedestal mount emergency phones located outside of a facility. These systems require one (1) two inch (2") schedule 40 conduit for telecom from a telecom room inside the facility to the pedestal location and a single one inch (1") schedule 40 conduit for power from an electrical room in the facility to the pedestal location. These conduits systems can be extended beyond the initial location using the same conduit and in ground junction box requirements detailed in this document.
- Other non-encased telecommunications conduit systems (if required) are to be addressed during facility design.

All telecommunications conduits are to be provided with the following:

- All telecommunications conduit systems installations, encased and non-encased, are to be inspected and approved by university ITS personnel before encasement. The site project management team will notify the university project manager when these inspections will be ready.
- All telecommunications conduits 2" and larger, encased and non-encased, are to have a conduit cleaning mandrel pulled through the conduits to verify obstructions or deformities of the conduits. This process is to be observed by university ITS personnel and project MEP firm, and signed off by the project MEP firm responsible for telecom and electrical design.
- All telecom conduits are to be provided with a standard pull string by the conduit installation contractor. Telecommunications contractor utilizing the conduits is to replace and leave a functional future pull string when installs through the conduits are complete.

UNCC ITS must approve any deviations from the standard conduit system deployments provided. ***Failure to comply with these requirements will result in refusal of installation of the conduit system by the university ITS Department.***

Telecommunications duct bank diversity:

Some UNCC facilities may require diverse telecommunications duct bank pathways into the facility due to its function. Facilities requiring duct bank diversity will be identified during facility design and implemented accordingly through project bid documents.

Outside plant cable installation requirements:

UNCC ITS currently provides installations, terminations, and maintenance of all university owned outside plant fiber optic and copper cables, along with utilization of corrugated inner-duct and Max-Cell conduit lining systems. New outside plant cables and conduit lining systems are installed through telecommunications infrastructure conveyance systems such as manholes and telecom duct banks provided by the construction project.

SECTION 7: SUPPORTED PERIPHERIAL SYSTEMS

Emergency Phones:
See ***Appendix E*** for photo examples***.*** UNC Charlotte deploys a standardized emergency phone system manufactured by Code Blue Corporation. UNCC ITS utilizes specific Code Blue emergency phone models for installation which consist of but not limited to:

- Exterior concrete pedestal mount pole phone units CB5-s, 9 foot tall
- Exterior parking deck mount pole phone units CB5-p, 7 foot tall
- Exterior wall mount stainless steel phone units CB2-e, approximately 36 inches tall
- Exterior/Interior wall mount stainless steel phone units 500-s small form phone

The Code Blue models listed can be found on the Code Blue website at http://codeblue.com/. The website contains schematic information regarding mounting and power requirements and can be incorporated into the project bid documents.

Code Blue emergency phone locations are to be provided as part of a project design process. Project designers are responsible for requesting meetings through the university project management team to meet with the university departments responsible for providing emergency phone locations.

UNCC ITS installation responsibilities for the Code Blue emergency phone system are listed below:

- ITS will purchase the Code Blue emergency phones (if required) for the project.
- ITS will receive the emergency phones and remove the phone modules from the phone housings for installation after the housings are installed.
- ITS will arrange delivery of the pole phone or wall mount housings to the project for installation on the provided infrastructure when requested.
- ITS will provide any factory Code Blue J-Bolts and template kits required for the pedestal mount pole phones.
- ITS to provide on-site contractor support to assist with any installation questions.
- ITS to mount the phone module back into the contractor installed housing and connect to the telecom contractor installed telecom line.
- ITS to install all cross connects required to provide dial tone to the phone module.
- ITS to program phone module, activate, label and test to the UNCC campus Police and Public Safety Department.

Project contractor installation responsibilities for the Code Blue emergency phone system are listed below:

- Project is to provide all conduits, 2” for telecom and 1” for power, and in-ground junction box systems as required by project documents and details.
- Project is to install all concrete pedestal bases per Code Blue factory specifications using Code Blue factory J-Bolt kits. No substitutions are allowed for the factory Code Blue J-Bolt kits or any extensions of J-Bolts when they are too short or installed incorrectly in the pedestal base.
- Project is to provide conduit and outlet box infrastructure as required by project documents and details to mount the Code Blue wall mount units.

- Project is to accept delivery of the pole or wall mount enclosure(s) from ITS and install on contractor provided concrete pole bases or wall mount locations.
- Project is to provide 110 VAC electrical circuit to each model requiring AC power. Project documents will dictate which units will receive 110 VAC power.
- Project is to terminate electrical circuit into electrical panel breaker in facility and label panel. Contractor is to label the pole transformer access cover or inside of the wall mounted enclosure with the electrical panel and circuit information the emergency phone power source is located in.
- Project is to terminate 110 VAC circuit on step down transformer mounted in the Code Blue phone housing and power unit up when permanent power is available.
- Project is to install required telecommunications phone cable from telecom room in facility to each Code Blue housing and terminate the phone cable on the termination hardware specified. Coil two feet of cable inside the housing and terminate on a RJ-45 jack as required by project documents.

UNC Charlotte constructs multi-level parking structures on campus. Parking structures require large Code Blue emergency phone deployments ranging from 20 to 30 units typically. Units are typically the Code Blue 2E stainless steel wall mount models.

Some parking structures require the Code Blue 5-p 7' tall parking deck mount pole phone unit. These units require special mounting and conduits systems be incorporated into the pour of the deck. It is important these locations be verified and addressed early in project design how the deck mount pole phones mounting and utility infrastructure will be established.

Public Access Phones:

Specific facilities on campus, primarily Residence Halls at this time, will receive public access phones. These phones are not used for direct emergency ring down purposes. They are used by the general public (student, faculty and staff) for local area or campus calls.

Where applicable, these phones will be installed in Residence Halls since the student rooms are no longer provided with a campus dial tone. These phones are to be placed strategically on each floor as required during project design and directed by Residence Life project management teams.

The project will be responsible for the conduit, back box and plaster ring infrastructure along with the telecom cable to each of these locations. ITS will be responsible for providing all cross connects to extend dial tone to the location and providing the phone unit.

Two way direct communications:

Some facilities may require the installation of a two way direct communications device or phone. This unit will communicate directly to university personnel responsible for first response. Typically these locations are in elevator lobbies or possible entrapment areas in a facility emergency. These locations are usually outfitted with a Code Blue ring down push button phone supplied by the university ITS Department.

These systems are not to be confused with an Area of Rescue system which some facilities may also require. UNCC ITS Department does not specify, install or maintain Area of Rescue systems. These

systems fall under Life Safety and are managed by the department responsible for the building it is installed in and will be determined on a building by building basis as codes require.

Elevator Phones:

All facilities with elevator service will require phone line(s) be installed to the elevator equipment room(s) within the facility. Typically, an individual cable is installed per cab requiring elevator emergency phone service.

The project will be responsible for installing the telecom cable from the closest telecom room to the elevator equipment panel where the phone cable interface is required. The elevator installer typically terminates the phone cable directly to their control systems and will provide programming for the elevator phone line. ITS will provide dial tone to the elevator phone cable and work with the elevator installation company technicians to activate the elevator emergency phone to call university Police and Public Safety Department.

Cameras:

UNCC ITS does not provide specific project design information regarding camera systems nor does ITS supply projects with cameras for installation. These systems are managed by the university Facilities Management (FM) Department or by the managing department for the building. If a project requires camera systems to be deployed, the project design teams should coordinate this through the university project management team to meet with the FM authorities responsible for camera design, installation, and management.

Wireless Access systems:

UNCC ITS is responsible for design input, implementation, installation, and management of the wireless access system for the campus community. The UNCC ITS wireless access system is currently deployed in 52 buildings (academic, business, athletic or recreational) on campus with over 800 wireless access devices installed. Several of these devices are also serving outdoor student patio areas and courtyards.

All facilities will receive wireless access points when being designed. ITS will provide design input for the areas where the wireless drop locations will need to be located. Each wireless access point location requires two (2) Category 6 UTP cables, however, bandwidth requirements for newer wireless technology may necessitate the installation of CAT 6A UTP cables. This would be determined during the project design phase.

UNCC ITS is responsible for providing and installing wireless access points in a single facility or complex of facilities as required when facilities are complete.

Building Automation Systems (BAS)/JACE Controllers:

UNC Charlotte Facilities Management Department is responsible for implementing and managing systems for monitoring building functions. These systems access mechanical systems in a facility for monitoring and programming for specific building operations.

UNCC ITS is responsible for providing data cables for university network connectivity to the head end device(s). ITS does not provide design criteria nor provide these devices to the projects for installation. UNC Charlotte Facilities Management Department is responsible for the implementation and management of these systems.

University 49er Card system devices:

UNC Charlotte deploys a closed card system on the campus known as the 49er card system. The system is utilized by students, faculty, and staff at UNCC and consists of several different types of readers providing access to doors, vending, laundry, value transfer stations, and copiers.

UNCC ITS is responsible for providing data cables for university network connectivity to the 49er Card device(s) and controllers when required on a project. ITS does not provide design criteria for the system and the devices that it communicates to nor provide the devices or controllers for a project.

The University 49er Card Department is responsible for the implementation and management of the system. Any questions regarding design and implementation of the 49er Card system will need to be coordinated and addressed through the university project management team.

Open Options systems:

UNC Charlotte Facilities Management department currently deploys the Open Options system. This system is utilized for access, camera interfaces, and security system interfaces.

UNCC ITS is responsible for providing data cable to the head end device(s) for campus network connectivity. ITS does not provide project design criteria for the system or the equipment to be installed. Any questions regarding design and implementation of the Open Options system will need to be coordinated and addressed through the university project management team.

Parking Structure and Parking Lot systems:

UNC Charlotte Parking Services department currently deploys various systems throughout the campus. These systems range from gate access and exit control, pay on foot stations, vehicle charging stations, camera systems, etc.

UNCC ITS is responsible for providing data cables to the individual or head end devices, security or parking services room for the facilities that will require campus network connectivity. ITS will provide specific details during design of the facilities for the required ITS telecom conduit infrastructure support systems.

ITS does not provide design criteria for Parking Services systems or the equipment to be installed. Any questions regarding design and implementation of the Parking Services required systems will need to be coordinated and addressed through the university project management team.

Off campus video and data service providers:

UNC Charlotte Residence Life Department currently utilizes off campus providers for their video, data, and wireless services to the students residing in their housing facilities. Additionally, there is university supplied voice and data services to the admin and staff in the housing facilities. Other campus departments also utilize off campus providers for video feeds.

UNCC ITS currently provides the video and data service providers trunk pathways thru the university fiber optic network linking their electronic systems together and independently of any university electronics systems. No additional underground fiber optic work is required for these entities unless otherwise directed during design.

The structured cabling system(s) utilized for the students suites and other common student access areas within the facility will be determined at time of project design.

Fire alarm systems:

The UNCC ITS Department does not install, maintain, monitor, or provide design requirements for the campus wide fire alarm system. However, the ITS department does support the fiber connectivity for the trunk system that communicates to the Police and Public Safety Department.

The campus wide fire alarm system communicates on a fully independent and interconnected Multi-Mode (MM) fiber optic cable system. In new construction, the Project Design RCDD is responsible for designing the MM fiber optic riser trunk cabling that will be required from the closest telecom room to the main Fire Access Control Panel (FACP).

To assist with the design, there are two methods that can be used to provide connectivity to the panel. If the main FACP panel is within 20 meters of a telecom room that will have MM fiber cable in it, 20 meter fiber jumpers can be installed between the telecom room and the FACP provided there will be enough slack in the jumper to adjust to any changes in routing. The telecom contractor will install two (2) 20 meter MM fiber jumpers between the two rooms in contractor provided conduit or inner duct to protect the fiber jumpers.

The second method would be used if the distance exceeds 20 meters. In this scenario, a 6 strand MM plenum rated armored fiber cable will need to be installed between the telecom room and the FACP. This cable will be required to terminate with LC connectors on LC coupler panels in appropriate rated fiber enclosures on each end and be labeled as fire alarm communications trunk cables. Fiber optic jumpers provided by the university can then be installed from the termination cabinets to the FACP and in the telecom room as needed.

SECTION 8: ITS TELECOMMUNICATIONS PROJECT DOCMENTATION

Horizontal Structured Cable testing requirements:
UNC Charlotte ITS deploys the Siemon/Commscope horizontal cabling system which requires that a 20 year applications base warranty be applied.

The telecommunications regulations governing body(s) EIA/TIA establishes industry standard horizontal structured cable testing parameters. The EIA/TIA testing parameters are updated on a regular basis as dictated by the industry with advancing cable and electronics technologies.

All horizontal structured cable tests performed for warranty purposes must follow the minimum EIA/TIA testing standards along with any additional testing parameters the cabling warranty provider may require at the time of testing. All cable testers are to have the most current versions of the testing parameter software downloaded into the tester and are required to have current calibration certificates before testing is performed.

Cable testers must be able to provide test results in standard information text and graphic chart form on digital and print based media. ITS requires that all test results be saved on digital media and provided to the RCDD telecom designer for review no later than 5 days prior to any connectivity being applied to the horizontal cabling system. All horizontal structured cable test results require a **Full Pass** test result to obtain the required cable warranty.

ITS reserves the rights to perform random testing on the horizontal structured cable system before any network connections are made and once the cables are completely terminated end to end and the telecom contractor releases the system as complete.

The RCDD telecom designer will be responsible for providing additional test documentation required by industry standards and project close out documentation in the written bid installation specifications section issued for a project.

Fiber Optic cable testing requirements:
UNCC ITS deploys a Commscope fiber optic cable and termination system consisting of both SM and 62.5-125 grade MM fiber cables, LC direct terminate connectors, LC pre-terminated pig tails for fusion splicing, and LC coupler panels. Fiber termination and splicing housings are provided by OFS and Fiber-Fab.

ITS does not require warranties on the fiber optic outside plant or riser cable systems.

The telecommunications regulations governing body(s) EIA/TIA establishes industry standard fiber optic cable testing parameters. The EIA/TIA testing parameters are updated as the industry requires with advancing fiber cable and electronics technologies. All fiber optic cables are to be tested minimally to EIA/TIA industry standards and for the mode of cable installed.

ITS requires the following test procedures on outside plant fiber optic cables if installed by the projects telecom installers. The following requires use of an Optical Time Domain Reflectometer (OTDR) and Power Meter.

- Bi-directional test of the MM strands at both 850 and 1300 wavelengths
- Bi-directional test of the SM strands at both 1310 and 1550 wavelengths
- Power meter test in one direction of MM strands at both 850 and 1300 wavelengths
- Power meter test in one direction of SM strands at both 1310 and 1550 wavelengths

ITS requires the following test procedures by a Power Meter on all interior fiber optic cable riser systems installed by the projects telecom installers.

- One direction test of the MM strands at both 850 and 1300 wavelengths
- One direction test of the SM strands at both 1310 and 1550 wavelengths

All test results for OSP and interior fiber testing are to be saved on digital media and provided to the RCDD for review no later than **5 days prior** before any connectivity is applied to the cables. All fiber cable strands tested must provide an industry standard passing test result when complete.

ITS reserves the rights to perform random testing on any fiber optic cable system before any network connections are made and once the cables are completely terminated or spliced end to end and the telecom contractor releases the system as complete.

The RCDD telecom designer will be responsible for providing additional test documentation required by industry standards and project close out documentation in the bid installation specifications issued for a project.

Copper multi-pair testing requirements:

Some UNCC projects may require the installation of outside plant copper multi-pair cables by the projects telecom installer. These cables are to be tested utilizing the Fluke Copper Pro multi-pair copper cable tester. The tester provides the copper multi-pair testing parameters required by the industry. The tester can also save the test information for download to digital or print media.

Test results provided by the Fluke Copper-Pro tester are to be saved on digital media and provided to the RCDD for review no later than **5 days prior** before any connectivity is applied to the cables. Test results are to provide a 100% pass result on the cable tested. The RCDD is to provide additional details on close out documentation for the Copper-Pro test results in the written bid specifications section in the project documentation.

As-Built documentation requirements:
UNCC ITS requires that As-Built plan documentation be placed in each telecom room containing horizontal structured cable from the telecom room to the individual outlets in the field.

At a minimum, the As-Built plans to be placed on the telecom room walls should display:

- A clear floor plan drawing with no other utilities shown other than telecom
- Drawing to be presented on minimum 30" X 30" laminated or velum sealed paper
- Drawing to clearly show the outlet location in the field and the outlet identification
- Plans are to be attached to telecom room wall in a secure method (no thumbtacks)

ITS requires a rough draft As-Built plan be placed in each telecom room wall no later than 5 days prior to any connectivity being made in the facility. Final clean laminated or velum As-Built plans should be placed in the telecom rooms no later than 90 days after project is complete.

Telecom installation contractors are responsible for providing the telecom As-Built close out documentation as required by the RCDD in the project bid documents.

ITS/Project Design RCDD site visit requirements:
UNCC ITS requires that the Project Design RCDD perform site visits at critical phases of the telecommunications install to review the following during construction:

- Perform above ceiling inspections on cable conveyance systems, if designed by the RCDD, for proper installation.
- Perform above ceiling inspections when horizontal cable system installation is completed by the telecom contractor and ***before the ceiling tiles are installed***.
- Perform telecom room build out inspections when telecom rack, wire management, and runway systems are installed and cables are formed to termination areas.
- Perform inspection after cable terminations have been performed at the outlets and the patch panels.
- Perform final punch list inspections after telecom contractor has released project areas as complete.
- Perform other site visits if required by owner or telecom installation contractor during construction process.
- Perform final sign off on telecommunications installation project.

RCDD will be required to provide project inspection reports to the design team for review and release to the project contractors for corrective actions if required. Please refer to ***Attachment 1*** of this document for additional RCDD requirements.

Horizontal structured cable warranty requirements:
UNCC ITS requires that a 20 year applications based warranty be applied to the Siemon/Commscope horizontal structured cable system. The Siemon Company will retain ownership of the cable warranty and will provide warranty claim work if required at a future time if the cable system installed fails to perform at industry standards.

At time of project bid and commencement of the telecom installation, the telecom contractor must retain a current Siemon Company Certified Installer (CI) certificate and be in good standing with the program. The RCDD will be required to verify that the telecom contractor utilized for the installation conforms to the CI installer requirements. If the telecom contractor does not meet the CI installer requirements, the RCDD will be responsible for notifying the project manager that the contractor does not meet eligibility and must be removed and replaced with a current certified CI installer.

SECTION 9: ITS BID DOCUMENTATION REQUIREMENTS

ITS Bid Alternate Specifications list document:
The UNCC ITS bid alternate material list is to be included in the telecommunications bid documentation for all university projects requiring installation of structured cabling systems.

The list provided in this document is a telecom materials alternate outside the base bid specification provided by the RCDD. UNCC ITS will provide additional bid documentation if required by the RCDD or other project design team members during project design.

End Document
10/29/15

Attachment 1

UNC CHARLOTTE ITS DEPARTMENT
REGISTERED COMMUNCIATIONS DISTRIBUTION DESIGNER
(RCDD) REQUIREMENTS

The following UNC Charlotte ITS document is to serve as a primary minimum standards requirement for all UNC Charlotte Capital construction projects, and when applicable, with UNC Charlotte Facilities Management Design Services projects.

UNC Charlotte ITS Department retains ownership and distribution of this document. Any questions regarding the requirements contained within the document should be directed to the ITS department through the UNC Charlotte Construction Project Manager for the project being constructed.

UNC Charlotte ITS Department requires an RCDD on all design projects to be responsible for the day to day responsibilities of the telecom design unless directed otherwise in writing by the ITS Department. ITS strongly prefers the design process in which the RCDD works directly (direct employment or contractually retained) for the architectural design firm responsible for the project, as a standalone design entity. It is requested that the telecom designer not be a subcontracted consultant to the MEP firm.

If an architectural design firm does not have a properly qualified RCDD under direct employment, they are required to retain the services of a properly certified and credentialed RCDD. UNC Charlotte ITS requires that the RCDD retained for a UNC Charlotte design project work in the capacity as an independent RCDD and not be employed by any potential bidder or vendor for the construction of the project. This ensures that UNC Charlotte will receive the best bids from the best cabling companies with minimal possible conflicts of interests. The selected for a UNC Charlotte design project must be within a 2 hour radius of the Charlotte metro area.

Any RCDD in the role of telecom designer for the project is required to submit copies of all current BICSI certifications, other required credentials, and a resume to the project architect showing that the RCDD is active in the telecom design industry and in good standing with the BICSI accreditation organizations. UNC Charlotte ITS will require copies of the RCDD certificates and credentials from the architectural firm for ITS review and comments at the time of project bid submissions.

If the UNC Charlotte ITS Department determines that the telecom designer does not possess the qualifications to support the project, ITS reserves the right to require the architect to replace the RCDD with another that meets the requirements contained within this document and project documents and approved by the ITS Department.

UNC Charlotte ITS Department reserves the right to waive the requirement of the RCDD when deemed applicable by the UNC Charlotte ITS Department on specific projects in which the ITS Department will perform the cabling installation. This would typically be a specific project which would entail a smaller square footage facility with a small cabling deployment within the facility of approximately 50 to 60 telecom outlet locations. Competing design firms are required to clarify thru the UNC Charlotte Capital project manager and UNC Charlotte ITS Department if uncertain of the project requirements.

RCDD CREDENTIAL/CERTIFICATION REQUIREMENTS:

The RCDD selected for a telecom design project on the campus of UNC Charlotte is required to provide the following credentials and certificates, or equivalent documentation when permitted.

1) Current BICSI Registered Communications Distribution Designer in good standing (RCDD) Certificate(s)

2) Knowledge of Wireless Access systems and Local Area Network systems design

3) Previous telecommunications design experience in Business, Research, and University campus environments is required

4) Minimum 5 years of telecommunications design experience to include:

    - Various types and categories of horizontal UTP/STP structured cabling systems including building riser systems with multi-pair copper and multi-strand MM and SM fiber optic cable systems.
    - Outside Plant multi-pair copper and multi-strand MM and SM fiber optic systems both underground and overhead.
    - Knowledge in the design and implementation of telecommunications conduit/duct bank systems and manhole deployments.
    - Large structured cabling system deployments successfully installing, terminating, and testing to completion a minimum of 500 Category 6 or higher category horizontal station cables.
    - Telecommunications and server room(s) deployments and requirements.

RCDD PROJECT DESIGN RESPONSIBILITIES:

- ITS will work directly with the RCDD thru the university FM project management team to develop a telecommunications installation tailored to the facility being built on campus.
- Provide and administer written bid spec for cabling project being bid.
- Provide and administer telecommunications “T” drawings to the project, to include and not limited to, telecom outlet locations, cable tray or cable support systems, telecom room lay outs and deployments with rack raceways, copper and fiber optic riser systems, grounding systems, wireless cabling systems, camera cabling systems, outside plant entrance cables, cable types and termination system to be installed, etc.
- Respond to and administer any addendums, amendments, RFP’s, RFI’s, etc., that are generated regarding the telecommunication cable or infrastructure installs.
- Provide and administer UNC Charlotte ITS Department ***bid alternate material list*** (to be provided by ITS to the RCDD) in written bid spec.
- Review first submission of the ***bid alternate material list***, telecommunications technicians certifications submittals, and cabling system installed required certifications from telecom contractors with ITS and University construction project management for comments and/or re-submission(s). Re-submissions can be transferred electronically for review to ITS after the initial ITS submittal meeting.

- Attend construction meetings

- Perform above ceiling walk-through inspections for compliance with project requirements.
- Perform telecom room build out compliance walk-throughs
- Perform final walk-throughs as required to provide the project with punch lists.
- Review all cable test data and as-built documentation
- Perform final acceptance inspections

Revision Date: October 29, 2015

Attachment 2

UNC Charlotte Telecommunications Cabling Infrastructure Bid Alternate Specifications List

This document is to serve as the UNC Charlotte ITS Department preferred vendor equipment bid alternate material list. This list and the material contained within are to be utilized by the UNC Charlotte ITS Department when conducting internal bid projects; by the Project Design RCDD (referred to as RCDD) on all UNC Charlotte Capital Improvements department projects; and UNC Charlotte Facilities Management Design Services department projects.

This is a **required bid document** for use by any of the project design sources listed in paragraph one. Pricing must be submitted by the competing telecommunications companies based on the manufacturers and part numbers contained in the lists within the accompanying document.

UNC Charlotte ITS does not support the use of the preferred vendor equipment bid alternate material list by a non-certified designer that does not hold a current RCDD Telecommunications Design Certificate acting in the role as a RCDD on any UNC Charlotte project. Consent to deviate from this requirement is to be requested in the project design bid process by the project facility designers or MEP Engineering firms responsible for providing this design service to the project. The requirement of the RCDD will be determined on parameters of the actual facility being designed and the requirements of that facility. UNC Charlotte ITS will review and respond to exemption requests from this requirement on a facility by facility request basis.

** See UNC Charlotte ITS Department RCDD requirement guidelines in the UNC Charlotte Master Campus Design Manual **

The material contained within the lists provided in this document, included with part numbers and installation details and recommendations, is to be utilized when providing telecommunications Intra and Inter facility telecommunications infrastructure cabling bids on the campus of UNC Charlotte.

The materials listed within this document are legacy utilized at this time on the campus for daily moves, adds, changes, renovations, and any new construction performed on the UNC Charlotte campus and auxiliary university sites located outside the current campus property boundaries.

The materials list that is provided in this document will not contain quantities, only the specific manufacturer and part number, and the detail for what that particular part or category of material can be utilized for within the cabling installation. Telecommunications companies competitively bidding on installation projects at UNC

Charlotte will be required to estimate quantities of the bid alternate preferred material based on information provided on the project drawings and written bid documentation. Bidding telecommunications companies will be responsible for providing all material required beyond the bid alternate base installation materials listed to provide a complete telecommunications installation. Those materials can include but not be limited to all consumables such as, tapes, strings, screws, nuts, bolts,

anchors, grounding, labels, J-Hooks, or any other specialty consumables required to complete the telecommunications install.

UNC Charlotte ITS may request and review, at any time, telecommunications installation contractor's materials and documentation listings which contain part numbers and quantities of materials ordered. All intact, suitable to be installed and excess materials and components are to be turned over to UNC Charlotte ITS in a manageable and orderly manner after work is completed on the project.

UNC Charlotte ITS will provide clarifications on material or information contained within this document for the telecommunications installation contractor when requests are received thru the proper project channels. It is the responsibility of the telecommunications contractor to expedite and follow through to resolve all RFI's required for clarifications on any information contained within this document and other project documents.

UNC Charlotte ITS currently utilizes the following major manufacturer components in our day to day telecom infrastructure deployments:

- Commscope fiber optic and copper cabling
- Siemon jacks, faceplates, patch panels, patch cables, and terminations
- Siemon (current) and Panduit (legacy) wire management
- CPI Relay Racks and raceway components
- Commscope fiber optic components, coupling panels, direct application connectors, fusion splice pigtails, etc…
- OFS and TE/AMP fiber optic cabinets and splice bays w/ splice components

UNC Charlotte ITS utilizes a partnering horizontal structured cabling system deployment consisting of Commscope UTP cables with Siemon Company termination hardware. UNC Charlotte ITS requires minimum 20 year product application warranties on all applicable horizontal UTP cabling deployments as defined in the project bid documents. In order to install the Siemon/Commscope partnered cabling solution and provide the Siemon 20 year cable applications warranty, the telecommunications contractor must be in good standing and with current Siemon Company certifications at the time the project is being bid. In order to provide the required cabling installation certification and warranty, **the contractor must be Siemon CI certified to install the Siemon/Commscope cabling system.**

** Note: No "project specific" installations by a non-certified Siemon CI will be allowed. Contractor must be established, active, and in good standings in the Siemon CI program at time of project bid. **

The telecommunications installation contractor selected for the project will be responsible for providing the project a clearly copied, highlighted, and legible material submittal, Siemon CI certification submittal, and technician qualification submittals as required and within the time frames set by the project. UNC Charlotte ITS along with the RCDD telecom designer will review and identify any deficiencies in the submittals for the project. If deficiencies are found, the submittals will be rejected and a re-submit will be requested along with the recommended corrections for the deficiencies. This

process will continue until acceptable submittals with the correct telecom material along with any other requirements of the submittals process are approved.

The following sections contain the UNC Charlotte ITS preferred manufacturer material lists. Each list will provide a cross section of preferred material required for installation. Additional components that a preferred manufacturer carries under their product lines can be submitted for use and reviewed in the material submittals process. Additional components being submitted cannot substitute for the required manufacturer base components.

Parts by each preferred manufacturer required to complete the install of a particular component or components combined may not be contained in the lists provided. The major base components will be listed but it will be the responsibility of the telecommunications contractor to provide all the parts required to install a component or components provided on the list. All items required for a complete install should be provided in the telecom material submittals and will be reviewed accordingly.

Telecommunications installer is not to deviate or substitute for any item contained in the following lists unless otherwise directed by the project with UNC Charlotte ITS approval. The only exception will be if "or equivalent" is specified at the end of a part number. If contractor proceeds with ordering telecom material without the proper material submittal review process and sign off, the contractor will be liable for replacement of unapproved materials at their expense if deemed unacceptable by the project.

Category 6A cable and components are also provided in the lists. Unless otherwise directed by contract documents to install CAT6A cable and components, all UNC Charlotte telecom installs will utilize the base Ultra Media CAT 6 cable and component system.

It is understood that part numbers may change and that some components may be deleted or discontinued by one of the preferred manufacturers listed and the material lists may not reflect those changes. It is the responsibility of the telecom contractor to bring these changes to the RCDD's attention in the material submittal process. If part number changes or substitutions for a discontinued or non-compatible component are required, they will be reviewed and approved on a case by case basis.

UNC Charlotte ITS reserves the right to modify, add, or change any part that is contained in the material lists. UNC Charlotte ITS will notify the project in writing of the changes with the recommended corrective action.

SECTION 1: CABLES

The cables listed within this section are a reasonable representation of the primary base cables required to install on all UNC Charlotte projects. The manufacturer and part numbers, up to date at the time of release of this document, are provided. Project documents will clarify what cable types and any other specialty cables or cable assemblies that are required for installation and will be addressed on a project by project basis.

If cables listed below will not meet specific requirements set forth in the project documents due to fiber strand and copper pair counts, cable type or compositions listed, it will be the responsibility of the

telecom contractor to clarify the application required and provide a part number under the preferred manufacturer listed that will meet the requirement in the material submittal process.

Unless project documents with specific outside plant installation details are provided for the telecom project being bid. UNC Charlotte ITS purchases, installs, terminates, and tests all outside plant copper and fiber optic cables with required termination hardware to provide incoming voice/data services to a facility being constructed.

Manufacturer	Description	Part Number
Commscope	CAT 6 4 pair Plenum cable (UNCC GREEN)	Ultra Media 7504 Non Shielded
Commscope	CAT 6A 4 pair Plenum cable (UNCC GREEN)	10G4 Non Shielded
Commscope	CAT 6 Jell filled 4 pair cable	6-NF4
Commscope	Outside plant fiber cable 24/24 composite	D-048-LN-CM-F12NS-8W024-6F024
Commscope	Outside plant fiber cable 12/12 composite	D-024 LN-CM-F12NS-8W012-6F012
Commscope	Outside plant fiber cable 24 strand SM	D-024-LN-8W-F12NS
Commscope	Outside plant fiber cable 24 strand MM	D-024-LN-6F-F12NS
Commscope	Outside plant fiber cable 12 strand SM	D-012-LN-8W-F12NS
Commscope	Outside plant fiber cable 12 strand MM	D-012-LN-6F-F12
Commscope	Plenum fiber guard cable 24 strand SM	P-024-DZ-8W-FSUYL
Commscope	Plenum fiber guard cable 24 strand MM	P-024-DZ-6F-FSUOR
Commscope	Plenum fiber guard cable 12 strand SM	P-012-DZ-8W-FSUYL
Commscope	Plenum fiber guard cable 12 strand MM	P-012 DZ-6F-FSUOR
Superior/Essex	Plenum CAT 3 25 pair cable	18-499-36 “or equivalent”
Superior/Essex	Plenum CAT 3 50 pair cable	18-599-36 “or equivalent”
Superior/Essex	Plenum Cat 3 100 pair cable	18-799-36 “or equivalent”
Superior/Essex	Outside plant sealpic PE-89 50 pair cable	09-100-02 “or equivalent”
Superior/Essex	Outside plant sealpic PE-89 100 pair cable	09-104-02 “or equivalent”
Belden	Plenum foil wrapped 2 pair cable	Belden 8723

SECTION 2: TERMINATION SYSTEMS - COPPER

The termination hardware systems listed within this section are a reasonable representation of the primary base termination hardware required to install on all UNC Charlotte projects. The manufacturer and part numbers, up to date at the time of release of this document, are provided. Project documents will clarify which termination hardware is to be utilized for installation in required applications for the facility being constructed.

Telecom installation projects can require termination hardware to be placed or mounted in vendor specific applications such as modular furniture, wire mold type raceways, lab tables, lecture halls, overhead carrier systems, floor poke-throughs, in floor junction boxes, above ceilings, etc. Materials contained in the list provide some specific components required to install the specialty vendor applications.

It is the responsibility of the telecom contractor to coordinate with the installers of the specialty vendor systems to provide the proper telecom material and termination hardware required to terminate in these applications. All color finishes are to be coordinated and matched; for example, a tan wire mold system would use tan telecom termination hardware; a brushed stainless wire mold system would use a gray telecom termination system; a black mounting hardware in a modular furniture application would require a black telecom termination system.

When terminating in wire mold systems UNC Charlotte requires that a Decora or “Designer” mounting frame be provided to house the terminated telecom jacks in and color coordinated to match the system being installed.

When terminating in modular furniture, it is the responsibility of the telecom contractor to provide the proper color matched jacks, mounting frames, surface mount housings, bezels, etc. and to provide a complete and secure installation within the modular furniture.

Specific color icons are required for terminations at the telecom outlets and at the patch panels and are provided in the list. The icons are to be placed in the protective jack cover door at the telecom outlets and in the jack faces when terminated in the unpopulated patch panels in the telecom rooms. The color icons are as follows for the specific application of the cable being installed.

- Green --- For all general use CAT6 or CAT6A horizontal cables --- Green Icon to be placed on each end
- Yellow --- For use on all CAT6 or CAT6A horizontal cables used for POE-IP camera locations wired back to the patch panel --- Yellow Icon to be placed on each end
- White --- For use on all CAT6 or CAT6A horizontal cables used for Wireless Access Devices wired back to the patch panel --- White Icon to be placed on each end
- Red --- For Use on all CAT6 or CAT6A horizontal cables used for Point of Sale, Credit/Debit Card, all monetary type transaction machines wired back to the patch panel --- Red Icon to be placed on each end
- Blue --- For use on individual jacks in the rack mounted Analog Dial Tone Patch Panel. Details of this requirement will be provided in project documents

- Violet --- For Use on all CAT6 or CAT6A horizontal cables used for Audio/Video and specialized devices --- Violet Icon to be placed on each end

The following is a cross section for UNC Charlotte utilization of the required manufacturer base installation material used on all UNC Charlotte projects unless otherwise directed by bid documents.

- 48 Port unpopulated MAX patch panels
- 24 Port Z-MAX Category 6A UTP patch panel kits
- MAX DG faceplates 6 port white
- Z-MAX DG 6 faceplates 6 port white
- MAX CAT6 UTP jacks white with door
- MAX CAT 6 UTP jacks black no door
- Z-MAX CAT 6A UTP jacks white with door
- MAX and Z-MAX surface mount housings
- Specific color icons for both MAX and Z-MAX terminations
- MAX Industrial termination outlets where applicable
- 110 Tower termination systems
- 110 Tower systems wire management
- 210 Termination blocks (primary application utilized for transitioning gell filled 4 pair to dry plenum 4 pair)

**Note: UNC Charlotte purchases and installs all patch cords required for patch panel and outlet connections.

Manufacturer	Description	Part Number
Siemon	MAX CAT6 UTP jack white with door	MX6-F02-D
Siemon	MAX CAT6 UTP jack black no door	MX6-F01
Siemon	MAX CAT6 UTP industrial jack	X-6
Siemon	MAX CAT6 industrial jack dust cover	X-CAP
Siemon	Z-MAX CAT6A UTP jack white with door	Z6A-02D
Siemon	CT-Icon Green for MAX jacks	CT-ICON-07
Siemon	CT-Icon Yellow for MAX jacks	CT-ICON-05
Siemon	CT-Icon Violet for MAX jacks	CT-ICON-08
Siemon	Z-MAX Icon card Green	Z-ICON-07B (for use at jack and PP)

Siemon	Z-MAX Icon card Yellow	Z-ICON 05B (for use at jack and PP)
Siemon	Z-MAX Icon card Violet	Z-ICON-08B (for use at jack and PP)
Siemon	MAX DG faceplate white 6 port	MX-FP-D-06-02
Siemon	MAX SG faceplate white 2 port	MX-FP-S-02-02
Siemon	MAX Industrial faceplate stainless 4 port	XFP-D-04-SS
Siemon	Z-MAX DG faceplate white 6 port	10GMX-FPD06-02
Siemon	Z-MAX SG faceplate white 2 port	10GMX-FPS02-02
Siemon	MAX surface mount housing white 2 port	SM2-02
Siemon	Z-MAX surface mount housing white 2 port	MX-SMZ2-02
Siemon	MAX designer jack mounting frames white 2 port	MX-D2-02
Siemon	MAX/Z-MAX faceplate blanks white	MX-BL-02
Siemon	MAX unpopulated patch panel 48 port	MX-PNL-48
Siemon	MAX unpopulated patch panel 24 port	MX-PNL-24
Siemon	Z-MAX 24 port UTP patch panel kit	Z6A-PNL-24K (kit contains 24 UTP 6A PP jacks)
Siemon	Z-MAX patch panel label holder	Z-PNL-PS (used to hold specific color icons required at PP)
Siemon	110 Tower termination system 5 pair clip	S110MA2-300FT
Siemon	110 Tower termination system 4 pair clip	S110MB2-300FT
Siemon	110 Tower wire management vertical	S110M-WM-300
Siemon	110 Tower wire management horizontal	S110-A2-RMS-02
Siemon	210 Termination system block 4 pair clip	S210AB2-64FT
Panduit	Consolidation point access housing	WMCPEBL (to house 210 cable transition blocks)

SECTION 3: TERMINATIONS SYSTEMS - FIBER OPTIC

The termination hardware systems listed within this section are a reasonable representation of the primary base termination hardware required to install on all UNC Charlotte projects. The manufacturer with part numbers, up to date at the time of release of this document, are provided. Project documents will clarify which termination hardware is to be utilized for installation in required applications for the facility being constructed.

UNC Charlotte utilizes a hybrid fiber optic connectivity and enclosure system. The enclosure systems consist of Optical Fiber Solutions fiber optic cabinets and fiber optic splice enclosure cabinets, OFS fusion splice trays, TE/AMP direct terminate fiber cabinets, Uniprise fiber optic coupler panels, direct application termination connectors, and fiber optic jumpers utilized for fusion splicing pigtail cordage. Uniprise coupler panels provided in the material list will install into both the OFS and TE/AMP fiber cabinets. Project documents will dictate the use of the specific fiber optic enclosures and the methods of terminations that will be housed in them - fusion splicing or direct terminated.

UNC Charlotte currently utilizes the LC connector model on both MM and SM cables for direct terminate and pre-terminated pigtail fusion splicing applications. Project documents will dictate which termination or combination of termination methods will be performed on a specific project.

When direct terminating fiber cables, UNC Charlotte ITS requires the Anaerobic termination method utilizing the Uniprise fiber optic termination consumables kit with the proper grade polishing papers and current date adhesives for the connector type to be polished. Uniprise direct polishing procedures for the connector type applied are to be followed when performing direct terminations.

UNC Charlotte purchases and installs all fiber optic jumpers required for each project.

Manufacturer	Description	Part Number
OFS	Fiber optic termination cabinet 4RU	109182303
OFS	Fiber optic fusion splice shelf 5RU	301011037 (used with the 4RU enclosure for fusion splicing)
OFS	Fiber optic termination cabinet combo patch/splice 3RU	301039939
OFS	Fiber optic fusion splice trays	300386919
TE/AMP	2RU fiber termination cabinet (rack)	RMG-2000-000B
TE/AMP	Fiber termination cabinet (wall mount)	WMG-2000-00B
Uniprise	Fiber optic coupler panel SM LC 12 pack	PNL-BK-012-SFA-LC12-BL

Uniprise	Fiber optic coupler panel MM LC 12 pack	PNL BK-012-MFA-LC12-BG
Uniprise	Fiber optic direct terminate connector MM LC	MFC-LCR-09-BG
Uniprise	Fiber optic direct terminate connector SM LC	SFC-LCR-09-BL
Uniprise	Fiber optic jumper SM LC to LC 10 Meter	FEWLCLC42-JXM010 (utilized for making fusion splicing pigtails)
Uniprise	Fiber optic jumper MM LC to LC 10 Meter	FEMLCLC42-BXM010 (utilized for making fusion splicing pigtails)
Uniprise	Fiber optic buffer tube break out kits	KIT-090-012

SECTION 4: RACKS, RACEWAYS, WIRE MANAGEMENT, CABLE SUPPORT SYSTEMS

The support hardware systems listed within this section are a reasonable representation of the primary base cable and electronics support hardware required to install on all UNC Charlotte projects. The manufacturer with part numbers, up to date at time of release of this document, are provided. Project documents will clarify which support hardware is to be utilized for installation in required applications for the facility being constructed.

UNC Charlotte, ***in the past***, utilized a hybrid rack and wire management system consisting of standard Universal CPI 19" aluminum equipment racks with standard 3" side rails with accompanying CPI steel runway systems, along with Panduit 12" and 6" vertical and horizontal wire management systems. When performing installations in legacy facilities with the CPI/Panduit combination, additional CPI racks with Panduit wire management may be required to match the systems installed.

Presently, UNC Charlotte deploys a hybrid rack and wire management system consisting of a standard Universal CPI 19" Aluminum rack with 6" side rails and accompanying CPI steel runway systems. Siemon 12" and 6" vertical wire managers are utilized. Siemon 2 RU single-sided horizontal wire managers are installed on the front and back of each rack rail above and below each patch panel. This hybrid rack and wire management system is to be deployed in all new facilities at UNC Charlotte unless otherwise directed by project documents.

Base raceway system installs within a telecom room consist of 12" tubular universal steel raceway and accompanying installation components. Project documents will dictate if larger raceway systems with accompanying installation components are required within a telecom room.

Standard fiber optic duct or fiber runner fiber duct equivalent with required installation components and support systems attached to the raceway system or other support systems within a telecom room may be required. If required, project documents will dictate which type and size of fiber duct with support system is to be installed.

Fully enclosed equipment cabinets can be required on some projects. Project documents will dictate the use of fully enclosed equipment cabinets as required.

Cable support systems supplemental to a primary cable tray pathway system such as J-Hooks, Cable Saddles, D-Rings, etc., may be required for installation. Telecommunications contractor is responsible for providing the correct type and quantities of the supplemental support system required to meet cabling industry standards regarding the cable being supported.

Manufacturer	Description	Part Number
CPI	Universal 19” equipment rack black	55059-703 (3” rail rack)
CPI	Universal 19” equipment rack black	66353-703 (6” rail rack)
CPI	Universal rack concrete mounting kit	40604-001
CPI	Universal 12” tubular steel runway black	10250-712
CPI	Rack to 12” runway mounting plate black	10595-712 (for 3” rail rack)
CPI	Rack to 12” runway mounting plate black	12121-712 (for 6” rail rack)
CPI	Runway elevation kit	10506-706 (required install to elevate steel runway 6” off of equipment racks)
CPI	Junction splice kits	11302-701
CPI	Triangular support brackets for 12” runway	11312-712
CPI	Universal runway end closing kits	11700-712
CPI	Equipment rack mount ground bus bar	10610-019
CPI	Universal runway wall angle support	11412-712
CPI	Universal runway ground strap kit	12061-001
CPI	Universal runway radius drop out	12100-712
CPI	Universal runway radius drop out	12101-701
Hoffman	Enclosed Cabinet with internal wire management, front and back perforated split door system	H3964
Hoffman	Wall mount equipment enclosure	EWMWG482425

Siemon	Vertical 2 side wire manager with doors 6”	VCM-6D (used with CPI 6” rail rack)
Siemon	Vertical 2 side wire manager with doors 12”	VCM-12D (used with CPI 6” rail rack)
Siemon	Horizontal single side wire manager 2RU	HCM-6-2U (used with CPI 6” rail rack)
***** Note: Vertical and horizontal wire managers listed below are primarily used for mounting to legacy CPI 3” rail equipment racks *****		
Panduit	Vertical 2 side wire manager with doors 6”	WMPVHC45E
Panduit	Vertical 2 side wire manager 12”	PRV-12
Panduit	Vertical 12” wire manager	PRD-12
Panduit	Horizontal 2 side wire manager 2RU	NM-2
Panduit	Horizontal single side wire manager 1RU	NMF-1
Panduit	Horizontal single side wire manager 2RU	WMPHF2E
Panduit	Fiber optic fiber duct 4X4	S4X4YL6NM
Panduit	Fiber optic fiber duct cover	C4YL6
Panduit	Fiber optic fiber duct coupler fitting	FCF4X4YL
Panduit	Fiber optic fiber duct right angle fitting	FRA4X4YL
Panduit	Fiber optic fiber duct tee fitting	FT4X4YL
Panduit	Fiber optic fiber duct tee trumpet spill out	FTR4X4YL

SECTION 5: CABLE PROTECTION, CABLE SPLICE ENCLOSURES, SPLICE MODULES AND OTHER MISCELLANEOUS MATERIALS

The materials listed within this section are a reasonable representation of the primary base cable support hardware required to install on all UNC Charlotte projects. The manufacturer with part numbers, up to date at time of release of this document, are provided. Project documents will clarify which support hardware is to be utilized for installation in required applications for the facility being constructed.

UNC Charlotte requires that all shielded inter-building outside plant copper cables are terminated on a direct terminate cable protection apparatus sized for the copper pair count requiring protection. Accompanying cable protector modules are required to fully populate cable protector installed. Typically cable protectors will require the additional installation of a non-shielded multi pair hand off cable. Hand off cable is to be terminated to the protector out going service block and ran to the 110 Tower termination systems for distribution to the building riser cable and station cable system where required. Project documents will dictate the contractor or university responsibility regarding the installation of this system under the project being bid.

Typically all outside plant incoming service cables are installed in a homerun method from hub facility to facility under construction. Splicing copper or fiber cables can be incurred on a project pending the installation environment and possible project deviations. Splicing will be determined on a building by building basis and will be outlined in project documents as required.

Unless project documents with specific outside plant installation details are provided for the telecom project being bid. UNC Charlotte ITS purchases, installs, terminates, and tests all outside plant copper and fiber optic cables with required termination hardware to provide incoming voice/data services to a facility being constructed.

Manufacturer	Description	Part Number
CIRCA	Direct terminate protector 110 in 110 out 25 pair	1880ECA1-25G
CIRCA	Direct terminate protector 110 in 110 out 50 pair	1880ECA1-50G
CIRCA	Direct terminate protector 110 in 110 out 100 pair	1880ECA1-100G
CIRCA	Direct terminate protector 66 in 66 out 25 pair	2625QC/QC
CIRCA	Cable protector protection modules	CT4B1E

3M	Better Buried copper splice enclosures (to be poured)	BB 4X24 SB/2SC-LHS
3M	Splice enclosure re-enterable encapsulant	4442 High Gel Pouch in a pail 6000 grams 051138-36611
3M	MS2 copper straight splice modules	4000C-TR
3M	UR-2 copper straight splice connectors	UR-2

END OF DOCUMENT

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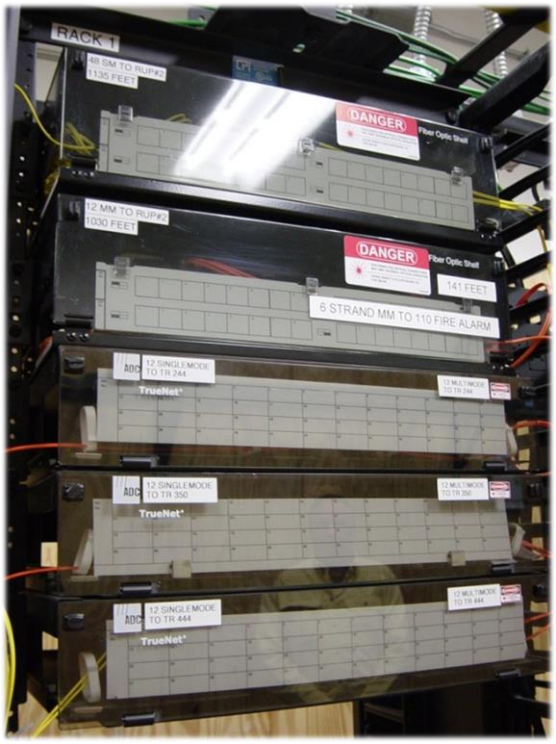
Appendix A: Telecommunications equipment racks

Figure 1: MDF and IDF rooms will typically be installed with a minimum of four racks with a standard equipment and patch panel configuration to be adhered to when installing network switches and patch cables. Rooms will have HVAC stand-alone units installed whenever possible and most be cooled 24X7, 365 days a year.

Appendix B: Fiber enclosure**,** wall field terminations and cable conveyance systems



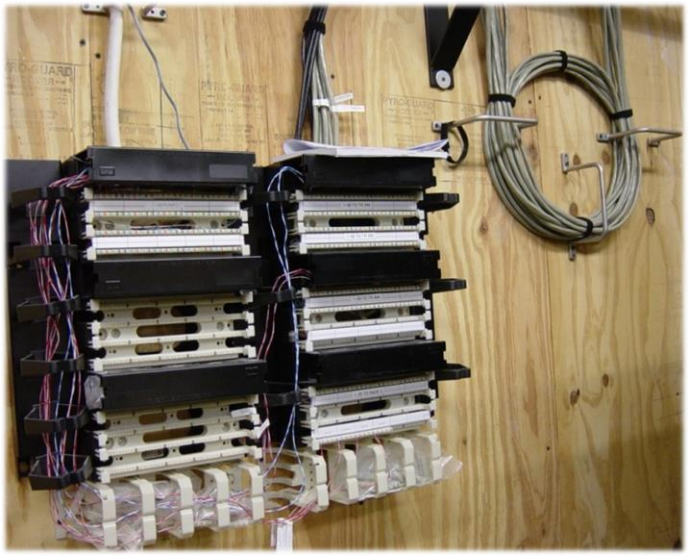
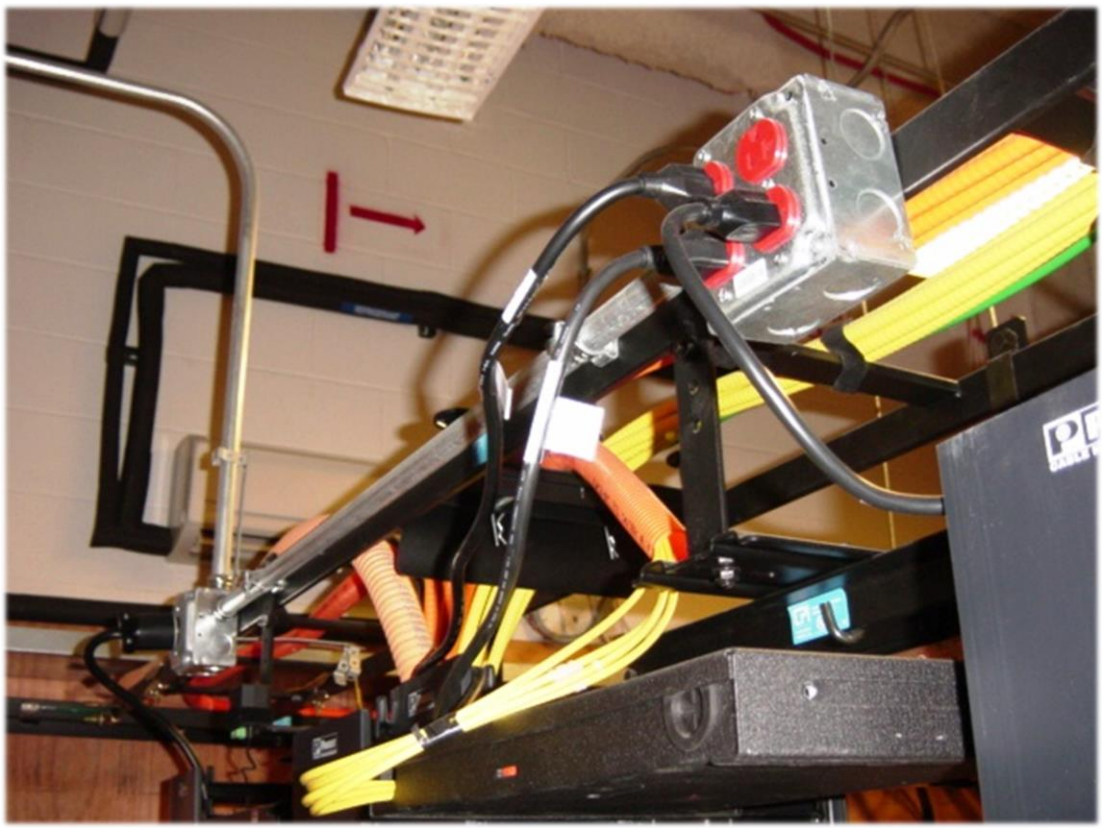


Figure 2: Fiber and copper cabling rack and wall field support systems compliment all cabling infrastructure systems used throughout campus. J-Hook and cable tray systems can be found in various building. Conveyance and pathway systems will be determined during project design.

Appendix C: Electrical Outlets

Figure 3: Outlet types vary in the MDF and IDF telecommunications rooms. Locations for these outlets will be determined at the beginning of the project during the construction design meetings. Typically, all outlets required will be installed above the equipment racks and in the rear of the rack system.



Appendix D: Conduit labeling and alternate cabinet systems

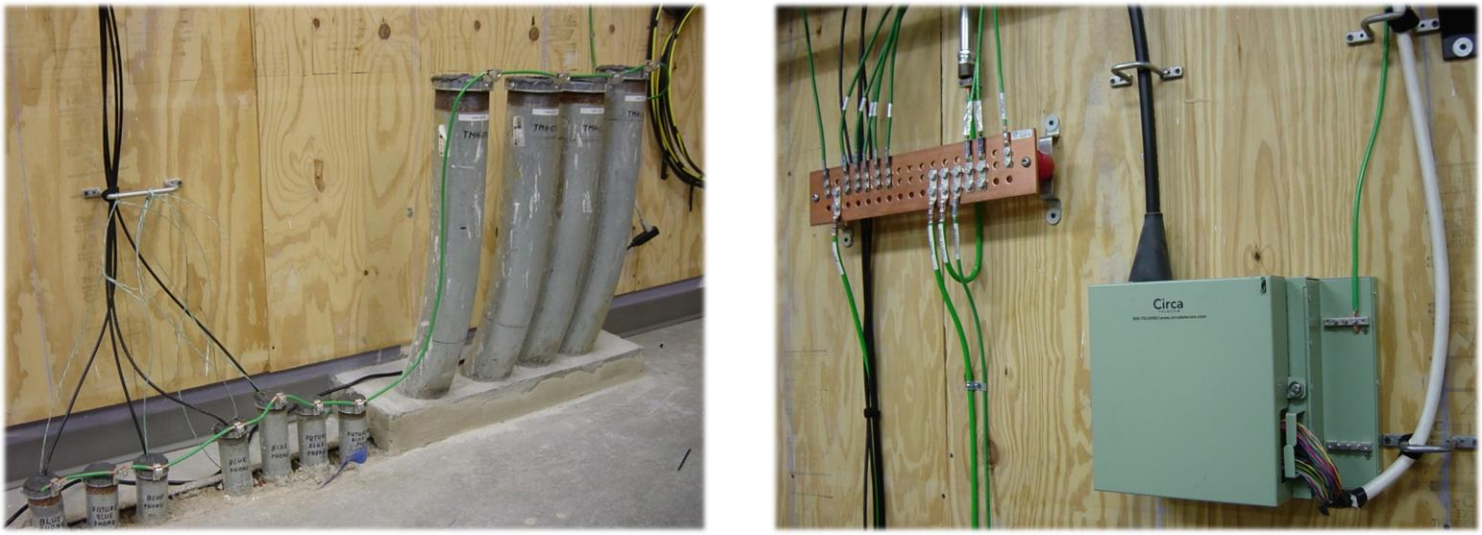


Figure 4: Conduits entering from below slab should be labeled and bonded. Main Ground Bar systems will be installed in each MDF and IDF room.

Figure 5: Wall mounted and outdoor cabinet systems will be used when dedicated data rooms are not available or when space constraints exist. These installation exceptions are coordinated during project design.

Appendix E: Code Blue emergency phones and Auxiliary Systems

Figure 6: Emergency Phones are installed throughout the campus. Code Blue Pole phones (standard) replace older Yellow Box phones. Wall mounted blue phones can be found in most parking decks.

Figure 7: Access Control, Building Automation Systems, and "Pay on Foot" stations are some examples of auxiliary systems supported by the campus network. The university network also supports video surveillance, vending, and point of sales devices through hard wire and wireless access systems.

Appendix F: Network outlets

Figure 8: From the patch panel to the end user, UNCC ITS utilizes a standard for colored icons to identify the port function on the faceplate. Specific university functions will dictate which termination method or hardware is used to protect the network ports and will be determined during project design.

Appendix G: Telecommunications boxes

Figure 9: Telecommunications boxes (Handholes) are utilized throughout the campus and tie back to other handhole or manhole systems as necessary to facilitate cable transitions, splices and interconnects between equipment and buildings. Local carriers such as AT&T, Time Warner, and Windstream enter our campus thorugh a joint ductbank and handhole system that connect through conduits back to the university manhole as seen below.

Appendix H: Telecommunications manholes

Figure 10: Telecommunications manhole and ductbanks are typically added during construction projects and when university growth requires additional conduit systems to allow for diverse fiber routes and network expansions. Extension rings are added as needed when terrain or other installation conflicts occur. Cable racking systems in manholes allow for an orderly transition of outside plant cables through the entry system.